

DISTRIBUTION A:

Approved for public release; distribution is unlimited.

School of Advanced Airpower Studies
Maxwell AFB, AL 36112

06/18/2001

1998. However, in the next twenty years as Chinese defense modernization continues, China will surpass Taiwan's ability to defend itself. Many US allies will not guarantee basing rights for during a conflict with China, so the United States military must be prepared to fight for Taiwan from locations in Taiwan and from US possessions. The "one China" policy that the US currently backs limits the military options to preposition people and supplies on Taiwan. The long ranges inherent with Pacific operations, for both deployment and employment, require that we be ready to defend Taiwan from austere and distant locations such as Andersen AB, Guam. China's ability to produce and procure modern weapons forces US and Taiwanese assets to fight within Chinese threat rings, while still achieving accurate results. US aircraft must be able to operate in these threat envelopes and gain air superiority, while supporting Taiwan's amphibious defenses. The United States can defend Taiwan twenty years from now, by effectively addressing the implications of this thesis.

15. SUBJECT TERMS

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Public Release	18. NUMBER OF PAGES 82	19a. NAME OF RESPONSIBLE PERSON Fenster, Lynn lfenster@dtic.mil
a. REPORT Unclassified	b. ABSTRACT Unclassified	c. THIS PAGE Unclassified			19b. TELEPHONE NUMBER International Area Code Area Code Telephone Number 703 767-9007 DSN 427-9007

CHINESE DEFENSE MODERNIZATION
AND THE DEFENSE OF TAIWAN:
IMPLICATIONS FOR THE USAF

BY

JERRY D. HARRIS JR

A THESIS PRESENTED TO THE FACULTY OF
THE SCHOOL OF ADVANCED AIRPOWER STUDIES
FOR COMPLETION OF GRADUATION REQUIREMENTS

SCHOOL OF ADVANCED AIRPOWER STUDIES

AIR UNIVERSITY

MAXWELL AIR FORCE BASE, ALABAMA

JUNE 1998

Disclaimer

The conclusions and opinions expressed in this document are those of the author. They do not reflect the official position of the US Government, Department of Defense, the United States Air Force, or Air University.

About The Author

Major JD Harris was commissioned through the Reserve Officer Training Corps, Washington State University in 1985. Graduating from Undergraduate Pilot Training in 1987, he went on to fly F-16s and graduated from the Fighter Weapons Instructor Course in 1993. His F-16 assignments include MacDill AFB FL, Nellis AFB NV, Moody AFB GA, Luke AFB AZ and Eielson AFB AK. Major Harris is a senior pilot with over 2,000 flying hours. He has a bachelor's degree in Mechanical Engineering from Washington State University and a master's degree in Aeronautical Science from Embry-Riddle Aeronautical University. In July 1998, Major Harris was assigned to the Sixteenth Air Force, Naples, Italy as an air strategist.

Acknowledgements

I would like to thank several people without whose support and help I would never have completed this thesis. I want to thank Dr. Karl Mueller, a Professor at the School of Advanced Airpower Studies, for his guidance and dedication to improving my thoughts and writing ability. I would also like to thank LTC Clay Chun, a Professor at the School of Advanced Airpower Studies, for his work in improving the product along the way.

I would also like to thank David “DAS” Shlapak, of RAND, for his patience and early insight into this thesis.

Most of all, I would like to thank Heather, my wife, and our sons Douglas and Johnathon for putting up with me during the past year. Their love and patience provided me the opportunity to complete this thesis in a timely manner.

Abstract

This thesis analyzes the United States commitment to defend Taiwan from Chinese aggression. Taiwan can gain air superiority over Taiwan and defend itself from an amphibious invasion now, in 1998. However, in the next twenty years as Chinese defense modernization continues, China will surpass Taiwan's ability to defend itself. Many US allies will not guarantee basing rights for during a conflict with China, so the United States military must be prepared to fight for Taiwan from locations in Taiwan and from US possessions. The "one China" policy that the US currently backs limits the military options to preposition people and supplies on Taiwan. The long ranges inherent with Pacific operations, for both deployment and employment, require that we be ready to defend Taiwan from austere and distant locations such as Andersen AB, Guam. China's ability to produce and procure modern weapons forces US and Taiwanese assets to fight within Chinese threat rings, while still achieving accurate results. US aircraft must be able to operate in these threat envelopes and gain air superiority, while supporting Taiwan's amphibious defenses. The United States can defend Taiwan twenty years from now, by effectively addressing the implications of this thesis.

Contents

	<i>Page</i>
DISCLAIMER	ii
ABOUT THE AUTHOR.....	iii
ACKNOWLEDGEMENTS	iv
ABSTRACT	v
LIST OF TABLES	viii
LIST OF ILLUSTRATIONS	ix
INTRODUCTION.....	1
Research Question	3
Methodology	4
CHINA’S MILITARY STRENGTH	1
China’s Land Forces	1
PLA Air Force.....	5
PLA Navy	11
Summary	16
TAIWAN’S MILITARY STRENGTH.....	18
Taiwan’s Land Forces	19
Taiwan Air Force (TAF)	20
Taiwan’s Naval Forces	24
Chinese Threat	25
Major Modernization Efforts	26
Summary	28
UNITED STATES RESPONSES FOR TAIWAN’S DEFENSE.....	30
Diplomatic Pressure	30
Blockade of China.....	31
Defense of Taiwan	32
Strategic Disarmament of China	35
Continental Invasion of China	36
Summary	37

UNITED STATES REQUIREMENTS FOR THE DEFENSE OF TAIWAN	39
Current and Near Future Situation.....	39
Future Situation.....	44
Implications for USAF.....	47
Summary	56
CONCLUSION	59
EXCERPTS FROM THE TAIWAN RELATIONS ACT OF 1979	63
BIBLIOGRAPHY	65

Tables

	<i>Page</i>
Table 1. Chinese Aircraft Modernization.....	15
Table 2. China – Taiwan Force Comparison.....	19
Table 3. Pacific Ranges.....	41

List of Illustrations

	<i>Page</i>
Map 1. Ranges From Guam and Taiwan.....	53

Chapter 1

Introduction

Following the collapse of the Soviet Union and the stunning American success in the Gulf War, the United States appears to be the world's single superpower. There are few competitors that can challenge the United States, either militarily or economically. This has led to many calls for a peace dividend and a US military significantly reduced, in both size and capability. Where should we look for our next conflict? How should the military prepare to fight the next war? What improvements should it make to fight the war?

Specifically, the nation and the Air Force in particular need to consider other factors too. Should we prepare for the worst possible scenario, so that we can fight any threat unilaterally? Would it be better to prepare for the most likely conflict, large or small, so that we will be best prepared for our current expectations? Given an unlimited budget and manpower, the US military could prepare for all contingencies. Yet we are fiscally constrained, so we must make choices in determining how to structure our force while defending our country today.

The Reagan defense buildup prepared the United States to fight on the plains of Central Europe against a massive Soviet army. Portions of the military have also long been in place in the Pacific, preparing to fight what had appeared to be the most likely scenario, another Korean conflict. Yet with the demise of the USSR and the rapidly failing North Korean economy, the military must look elsewhere to prepare for our next potential conflict.

Superpower status could be regained by a resurgent Russia or gained by a rapidly growing China. Russia is in the process of changing to a market based society and has severe

internal problems. Many of these problems will have to be solved prior to any bid towards regaining superpower status. Meanwhile, China's share of the world Gross Domestic Product (GDP) has already surpassed those of Russia, India and Japan.¹

The threat of China becoming a world superpower has loomed since the 1970s. The shift to a market-based society, beginning in 1978² is starting to take effect and China's increasing influence in international trade has forced Russia to take another look at their ability to become a peer competitor. China is competing for a larger share of trade with the ASEAN countries and Japan as well as preparing to make similar advances worldwide.

Taiwan has long been a political thorn in the side of Beijing. As China tries to become a world power, it may attempt to consolidate all of China, including Taiwan, under one roof. US policy towards China is based on a One China policy, yet in 1979 the Taiwan Relations Act (TRA) was passed.³ Although it is ambiguous regarding many facets of US-Taiwan relations, it states that the United States will defend Taiwan from Chinese aggression. The TRA stipulates that the Taiwan-China situation is to be settled through peaceful means. Should the PRC attempt by other than peaceful means to reunify China, however, the United States military may be called upon to defend Taiwan.

As China improves economically and broadens its overseas interests, improvements will be necessary for its military. The previous focus of the People's Liberation Army (PLA) was a possible large-scale cross-border land invasion by the now defunct USSR. As the Russian threat in the north diminishes, China is beginning to modernize its logistics and force projection capabilities. The Chinese show of force in the Taiwan Straits from mid-1995 to March 1996 was intended to deter Taiwan from seeking independence. Yet "the PLA lacks a credible warfighting deterrent against Taiwan."⁴ Taiwan has a population and land mass about 2 percent as large as

¹ International Monetary Fund, *World Economic Outlook*, a Survey by the Staff, October 1997, 4. Figure 3 shows the changing relative positions in the world economy and shows that in the 20 years prior to 1997, that China's percentage of the world GDP has increased, while the US and European Union's share has steadily decreased. The IMF projects this trend to continue, with China's share of the world GDP surpassing the US and EU around 2007.

² Central Intelligence Agency, *The World Fact Book* (Washington: Brassey's, 1997), 103.

³ See Appendix for excerpts from the Taiwan Relations Act.

⁴ "Country Briefing: China", *Jane's Defence Weekly*, 10 December 1997, 25. The report expands on PLA planning, since two aircraft carrier battle groups were sent to the region during the Chinese show of force. The PLA believes that they would face 3 or 4 carrier battle groups in a military crossing of the Taiwan Strait. The limited ability of China to cross the short distance of the strait and land a force larger than one infantry division has focused their procurement process improving their force projection capability.

mainland China and is located only about 100 miles from China, yet could it withstand a Chinese invasion? If so, why should the US worry about Chinese ability to rise to superpower status?

The sheer economic and military size of China is immense. As the Chinese economy rolls along with a real GDP growth rate of 10.3 percent,⁵ it has the ability to make significant improvements to its military and logistical capabilities. These changes are beginning to transform the Chinese military from an antiquated 1950s force to a 1980s force. The upgrades are happening to physical forces (Army, Navy and Air Force) as well as to the structure and organization of the forces themselves.⁶

Rather than simply purchasing hardware abroad, China is beginning to pursue the ability to develop and produce modern equipment internally. The technology transfer to design and produce high technology equipment will improve Chinese ability to accomplish research and development of future advanced equipment. As China continues down its industrialization path, its ability to equip its military will rapidly improve.

America's military focus in the Pacific has been on Korea for the past two decades. The armistice that is in effect across the demilitarized zone is still a point of contention, yet North Korea appears to be diminishing as a threat. Today, as the North Korean economy fails, China's economic future looks bright, dragging a large military out of the past and into a more capable future.

This is one of the reasons that the US must look towards China while determining how to structure future forces. A direct conflict with China may not be the most probable scenario, yet just as we must prepare for the most probable, the US must also be ready for the worst possible scenarios.

Research Question

This project is centered on the current Chinese modernization program and looks at the trends that are developing. The USAF should not structure its entire force to deal with a conflict with China, but it should be flexible enough to handle the particular requirements for such a demanding scenario. As the US military moves away from a cold war posture with emphasis on

⁵ CIA, *The World Fact Book*, 104.

⁶ Larry M. Wortzel, "China and Strategy: China Pursues Traditional Great-Power Status," *Orbis*, Volume 38, number 2, Spring 1994, 157-175.

nuclear warfare, we must be prepared to fight the big fight and be able to continue with current peace enforcement and keeping missions.

Specifically, this thesis attempts to answer the following question: what are the implications for the USAF of the potential need to defend Taiwan from an aggressive China? To answer this question, this research is broken down into several parts to make it more manageable. The current situation and Taiwan's need for US support is evaluated first, followed by forecasted changes for the next twenty years. As China modernizes its military over the next twenty years, the problem significantly increases in difficulty. To determine Taiwan's need for support, a comparison is made between China and Taiwan, now and twenty years from now.

Determining an answer to the research question is important since the defense of Taiwan scenario is very different from any previous US combat experience. China is physically larger than the United States, with a massive ground and air force that might attempt to invade the island of Taiwan, a scant 100 miles from China. Unlike Desert Storm, the USAF may not have access to numerous airfields close to the engagement zone. The ranges involved in of deploying to and operating from Pacific airfields will cause great hardships on USAF assets. What does the USAF need to do to ensure that the US can defend Taiwan from China in the event that the military is called on to do so? Are there specific requirements for this scenario that are different from those of most other scenarios? Although we cannot be sure of the particulars of the Taiwan scenario, we may face similar situations in the near future.

Methodology

Exploring the current situation if China were to invade Taiwan today provides the answer for the near term. A simple comparison of military forces does not tell the entire story. China has a massive military, yet it can only bring a small portion of it to bear against Taiwan. Determining what China might bring to bear today, and Taiwan's ability to defend against this attack, provides the basis for assessing what the USAF needs to do to defend Taiwan.

Chinese military modernization may take many paths, depending on its economy, political and military leaders and the Chinese strategic environment. To answer the research question for a Chinese attack twenty years from now, this thesis first lays the ground work for what each military might look like and then considers different scenarios for USAF involvement.

This scenario assumes that an aggressive China is making political overtures towards Taiwan. China has stated politically that Taiwan is and always has been a renegade province and the matter is an internal conflict, not requiring international intervention. The United States' response was to reaffirm the TRA, and it is preparing to defend Taiwan from the PRC. China's response was a show of military force, consisting of ballistic missile exercises within Taiwan's territorial waters. China is massing several division sized infantry units on the Taiwan Strait coastline, preparing to embark on commercial and naval troop carriers.

The next chapter analyzes China's military strength. The People's Liberation Army (PLA) is detailed first, with its current capabilities and equipment. The PLA Air Force (PLAAF) section follows and explains the inventory of the PLAAF, its inherent strengths and weaknesses, and how it might be used in the scenario. The PLA Navy (PLAN) is discussed next in a similar manner. The final section of Chapter 2 discusses China's modernization plan for the near future and how this might affect the Taiwan scenario.

Chapter 3 covers Taiwan's military strength. The ROC land, air and sea forces and their capabilities are discussed, and comparisons are made to the appropriate PLA branch to show size and technological imbalances. Taiwan's modernization is affected by the fact that it is not recognized as a sovereign country. Not wishing to alienate China and other countries wishing to see a peaceful settlement to the situation, the United States limits the weapons it is willing to sell to Taiwan. Taiwan's modernization program follows the military capability sections and provides a glimpse of the future scenario.

Chapter 4 provides an overview of the possible US responses to a Chinese invasion. Responses ranging from diplomatic pressure, to an active defense of Taiwan, to a continental invasion of China are discussed. Not all of the responses achieve US goals of defending Taiwan, and a combination of some of the responses may be the best option. A case is made for an active defense of Taiwan, centered on gaining air superiority over Taiwan and the Strait, with some attacks against military targets in China.

To achieve the United States' objectives of defending Taiwan from a possible Chinese invasion, there are several implications that the USAF must address. Chapter 5 discusses these implications and makes specific recommendations for the USAF, based on when China might invade Taiwan. The near-term situation is discussed first, including basing opportunities. The

next section discusses what the next twenty years may look like and how that will affect the situation.

Chapter 6 summarizes this thesis, detailing what the USAF must do to assure that Taiwan can be defended. It reiterates why defending Taiwan is important and how the US military should prepare for this possibility. As the USAF prepares for future conflicts, the defense of Taiwan scenario poses some extraordinary requirements that the USAF must address. An air force designed with the needs of this scenario will also be much more flexible in dealing with other situations.

Chapter 2

China's Military Strength

One of China's strategic assets is its sheer size, in both territory and population. The People's Republic of China (PRC) is the third largest country geographically (behind Russia and Canada), and with 1.2 billion people (as of July 1996), it has the largest population in the world.⁷ However, China is continuing to grow in many other aspects. The Asian economic crisis has slowed China's growth, yet it has the eighth largest gross domestic product in the world, at \$509 billion per year.⁸ Additionally, as the following pages show, China has a vast array of military equipment that is being modernized at an accelerating pace.

China's Land Forces

The People's Liberation Army (PLA) is divided into seven Military Regions and is in the process of changing its focus. Many hostile neighbors have long surrounded China. Russia, India, and a revival of hostilities with Vietnam continue to be sources of possible aggression against China. This has forced Chinese leaders to concentrate on a continental strategy; however, China is now settling some of these disputes.⁹

The PLA has long been focused on massive ground campaigns, centered on its most abundant resource, people. Now as China diplomatically resolves many of the continental

⁷ Central Intelligence Agency, *The World Fact Book*, (Washington: Brassey's, 1997), 102.

⁸ Ibid., 104. GDP figures are extrapolated from 1995 and are based on World Bank estimates and Chinese growth figures, which may overstate China's GDP by as much as 25 percent.

border disputes, its worries about a massive land campaign are diminishing and it can begin to reshape the PLA into a power projection force.

During the Korean War, the PLA sent combat units from all of its Field Armies in support of the conflict, providing combat experience to a large portion of its force and leaders.¹⁰ These forces were equipped with Soviet equipment, which filled the gap in Chinese manufacturing capability. The current situation is very similar, as China is again purchasing high-tech equipment from Russia.

As the PLA slowly modernizes, smaller scale conflicts and limited wars are becoming its focus, allowing for a reduction of its massive ground force. Much of this change is due to the 1991 Gulf War, as a result of which China realized that a highly advanced force could devastate a numerically superior, but less advanced ground force. A study by the Chinese National Defense University summed up the lessons for Chinese forces to learn as the need to:

(1) reduce the number of soldiers and improve the armed forces' equipment, training quality and actual combat capability; (2) give priority to conventional arms over nuclear weapons; (3) introduce high technology, including advanced guidance systems, pinpoint accuracy bombing, weapons of mass destruction, and stealth aircraft; and (4) build a rapid-response force.¹¹

Additionally, China possesses weapons of mass destruction (WMD) in the nuclear, biological and chemical forms.¹² The Second Artillery Corps is China's strategic missile force and serves as the primary delivery means for nuclear weapons for the PLA. Tactical ballistic missiles could be used against airfields threatening a would-be invasion force. China's

⁹ "China, Russia resolve nearly all land disputes," *Jane's Defence Weekly*, 19 November 1997, 13.

¹⁰ Kenneth W. Allen, Glenn Krumel, and Johnathon D. Pollack, *China's Air Force Enters The 21st Century*, 14. Although they sustained major manpower losses, Chinese forces stopped a world power offensive.

¹¹ *Ibid.*, 33.

¹² Jacques S. Gansler, *Defense Conversion* (Cambridge, MA: MIT Press, 1995), 3.

intercontinental ballistic missiles might be used to threaten would be defenders of Taiwan. As a specific branch within the ground forces, the Second Artillery Corps is subordinate to the PLA.

The conventional ground forces of the PLA are being reduced in number. The PLA employs more than 8,400 main battle tanks (MBTs), 6,000 of which are Type 59s.¹³ Older weapons systems, like the T-34 and T-54 MBTs, are being phased out. Some of the most poorly equipped units at corps level are being deactivated or transferred to the People's Armed Police.¹⁴ This reduction allows for improved quality of the remaining force, both in training and equipment. Although the money saved will be apportioned throughout the PLA, the slice of the money that goes to ground forces will be focused on a relatively small number of units, leaving others with 1950s and 1960s technology.

China is beginning to design and test MBTs that nearly rival the US M1A1's capabilities. The Type 90-II MBT was revealed in 1997 and has improvements in three key areas of design: armor, mobility and firepower.¹⁵ China and Pakistan have produced about 200 Type 85-II MBTs, said to be similar to the Russian T-72¹⁶, which was outclassed by the newest Western tanks in the Gulf War. China's limited amphibious capabilities (discussed later) will restrict the number of MBTs that could be used in the scenario against Taiwan. Those that might be used would be the more modern Type 85s or Type 90s, if these are produced and fielded.

Ground force modernization includes emphasis on rapid reaction forces. These forces will have access to the best equipment and training, with a focus that has all the branches of the PLA working together. The PLA is improving capabilities to "undertake joint operations in and

¹³ *Jane's Sentinel*, (New York: Jane's Information Group, 1997), "China," paragraph 1.11.12. The T-59 tank is a Chinese-produced version of the Russian T-54, which entered service in the 1950s.

¹⁴ "Country Briefing: China, Major modernisation sees slimmer giant," *Jane's Defence Weekly*, 10 December 1997, 24.

¹⁵ *Jane's Armor and Artillery* (New York: Jane's Information Group, 1997), "China, MBTs and medium tanks," 6.

¹⁶ *Ibid.*, 7.

around China's littoral.”¹⁷ Although limited to a small portion of the ground forces, these rapid reaction units will become the elite and most often used forces of the PLA. China's limited procurement of airlift seems to indicate that these forces will require sealift in excess of what China currently employs.

The remaining ground forces will enjoy modernization at a slower pace, with incremental improvements in tanks and artillery. China has acquired the ability to mass-produce heavy field equipment that will replace the aging Russian equipment currently in use. Since Russia has been strapped for cash, it has begun to export front line equipment more actively than ever. China may again rely on Russia's eagerness for hard currency to acquire even more modern equipment.

One dilemma facing a ground force as massive as China's is the high cost of improving and modernizing the force substantially. The Russian equipment China is purchasing is about a generation behind US standards. China is not able to produce or buy equipment that meets US standards in the quantity needed to modernize the entire PLA, due to the cost of the equipment.

Training will continue to be a shortfall in the near future as well. As many units continue to operate obsolete equipment, they will have difficulty training and operating jointly with upgraded units. The few divisions that would participate in a Taiwan invasion would therefore not have trained against an equal or superior adversary. Restructuring the PLA ground forces will require improved officer education to deal with local conflicts, while also attempting to improve its littoral abilities and to project force as an emerging power.

China has a significant SOF force assigned to the PLA. A portion of that force may be operating and monitoring activities in Taiwan. If a shooting conflict were to erupt, these forces

¹⁷ “Country Briefing: China, Major modernisation sees slimmer giant,” *Jane's Defence Weekly*, 10 December 1997, 24.

would probably attempt to disable Taiwan's air defense network, allowing China to gain air superiority over Taiwan, in order to pave the way for a successful invasion.

PLA Air Force

The PLA Air Force (PLAAF) is subordinate to the PLA, and until recently has been led by a general officer who had advanced through the land forces.¹⁸ As aviation experienced leaders begin to filter through the PLAAF hierarchy, further changes may be accelerated. One of these is a possible transformation of the PLAAF from a primarily air defense force into an offensive striking force.

The complete subordination of the PLAAF to the PLA might imply that the PLAAF is a unit that directly supports the land forces. However, equipment shortfalls and the limited ability to command and control forces has hindered the PLAAF from performing such direct support missions. The PLAAF's key role in support of the ground forces is first to gain air superiority. The second is to attack enemy airfields and finally to coordinate with ground units to destroy enemy airborne troops.¹⁹ Specific emphasis is placed on the enemy airborne units to limit an adversary's ability to employ them against the PLAAF.

The PLAAF is primarily an air defense force, with more than half of the fighter force consisting of 3,200 J-6s, the Chinese produced MiG-19.²⁰ As the J-6 fleet continues to age, it is being replaced by fewer but more capable aircraft, such as the Russian Su-27 and the Chinese F-10. Although the aircraft that are replacing the older aircraft are much more capable, their

¹⁸ Allen, Krumel, & Pollack, xx. 1985 was the first time that an aviator commanded the PLAAF. Since then, only one post-Korean War aviator has held the command job.

¹⁹ Ibid., 119.

²⁰ Allen, Krumel, & Pollack, 163 and *Jane's Sentinel*, "China," paragraph 1.12.11. China has 100 J-8II, 500 J-7 and 400 J-5 aircraft in service. The J-6 is the Chinese version of the Russian MiG-19, the J-7 is a copy of the MiG-21, and the J-8 is an indigenous Chinese aircraft with capabilities only slightly better than the MiG-21. The remainder of China's aircraft fighters are a mix of reconnaissance, close air support and trainer aircraft.

numbers are significantly smaller and most are deployed to defend major cities and industrial areas in China.

Without air-refueling capabilities, even the more advanced aircraft will provide little in the way of force projection. The longer-range aircraft, particularly the Su-27s, provide the ability to project force over a distance of about 1,500 nautical miles (NM), but the limited numbers of these aircraft limit the Chinese ability to project significant force.

Aircraft such as the J-5, J-6, J-7 and various J-8s, which are deployed in large numbers, have a combat radius of about 370 NM²¹, which would allow for combat operations against Taiwan from only two existing Chinese airfields, both in the Nanjing military district. The remainder of the J-6s are spread throughout China to pursue the PLAAF air defense strategy. Although this falls into place with the older mentality of Chinese war plans, smaller scale limited conflicts will need a more capable rapid-reaction air force.

Acquisition of aircraft like the 72 Su-27 Flankers (48 delivered to date) are significant improvements for the PLAAF, yet the limited number of aircraft purchased represents only an incremental change to the overall capability of the PLAAF.²² China's ability to maintain the more advanced aircraft is limited, with the depot level work being accomplished in Russia.²³ The Su-27 is the only Chinese fighter capable of establishing Combat Air Patrol (CAP) stations on the east side of Taiwan. The other PLAAF aircraft are fuel limited and would not have sufficient station time for a CAP mission.

²¹ *Jane's All the World's Aircraft* (New York: Jane's Information Group, 1981-82), 31.

²² *Jane's Sentinel*, "China," paragraph 1.15.5, shows that the latest of the three Su-27 purchases brings the Chinese total to 72 Su-27. Of these, the last 24 will probably be assigned to the PLAN for maritime duties, when delivered.

²³ "Country Briefing: China, Russian imports step in to fill the arms gap," *Jane's Defense Weekly*, 10 December, 1997, 27.

The massive numbers of Chinese J-5s, J-6, J-7s and J-8s (more than 4000 total) play a very limited role against a Taiwan invasion scenario.²⁴ The PLAAF's current inability to fly the aircraft more than once every four days²⁵ and the small number of Chinese airfields within 200 NM of Taiwan minimize the impact of these older aircraft.

The PLA is negotiating to buy more aircraft from Russia, including 40 to 50 Su-30MK fighters.²⁶ Small purchases such as this will not substantially change the PLAAF, but do provide important technology transfer. After China has the ability to procure and operate modern aircraft in larger numbers, such as 300-500, then the PLAAF will have accomplished major improvements. It will take some years for China to afford such a large purchase.

A more likely scenario is for China itself to begin producing the aircraft. China has agreements with Russia to begin producing Su-27s, although it will take years for the infrastructure to be put into place and years after that before the first aircraft begin to be produced. The indigenously developed F-10 air superiority fighter will be a step in that direction, but the program has recently been delayed again for another five years,²⁷ due to limited access to Western technology.²⁸ The performance of the F-10 is likely to be equivalent to that of the F-16 when it is procured. Although this is a big improvement for Chinese capabilities, the F-10 will still be 1980s technology, three decades behind US equipment.

China employs weapons as antiquated as the aircraft it possesses. The obsolete J-5 aircraft are armed only with guns, while the more numerous J-6s are armed with guns and rear-hemisphere infrared missiles (similar to the US AIM-9P air-to-air missile (AAM)) that are easily

²⁴ The J-6 is the Chinese version of the Russian MiG-19, the J-7 is a copy of the MiG-21, and the J-8 is an indigenous Chinese aircraft with capabilities only slightly better than the MiG-21.

²⁵ *Jane's Sentinel*, "China," paragraph 1.12.2.

²⁶ "Country Briefing: China, Russian imports step in to fill the arms gap," 27.

²⁷ *Ibid.*, 25.

²⁸ *Jane's Sentinel*, "China," paragraph 1.15.6.

decoyed by flares. The J-7s and J-8s employ newer Chinese versions of Soviet missiles, but these missiles are still 1960s technology and are very limited in capability.

The Su-27 employ missiles that approach US standards of 1980s technology, yet may have greatly increased range capabilities. The AA-10 *Alamo* A/B missiles²⁹ have ranges similar to the US AIM-7 series of AAMs. The Su-27 is also capable of carrying AA-10C/D missiles (radar guided and IR guided respectively) that are “long-burn” variants of the A/B missiles, providing increased ranges, similar to or greater in range than the US AIM-120 AMRAAM.

The ability to acquire and maintain high technology aircraft is not the end of the problem for the PLAAF though. Aircrew training and employment doctrine must also be improved. Most of the Chinese pilot training, at all levels, is conducted under daytime VFR (Visual Flight Rules). The pilots do not fly as many hours as their Western counterparts, with bomber pilots averaging 80 hours a year, fighter pilots 100-110 hours a year, and ground attack pilots up to 150 hours a year.³⁰ Much of this flight time is consumed by maintaining basic navigational skills, rather than operational flying skills. US pilots fly about the same number of hours, but their training is more combat oriented, with less emphasis on basic skills.

Chinese training for an invasion of Taiwan may also bring other training deficiencies to the surface. The PLAAF does not train over water, and believes that over water flight is inherently different (and more dangerous) than flight over land.³¹ The lack of over water flight training for PLAAF pilots will reduce China’s ability to gain air superiority over and make attacks against Taiwan. Russian trainers complain about the quality of the Chinese pilots flying the Su-27, yet

²⁹ AA-10A is a radar guided missile and the AA-10B is an IR guided missile.

³⁰ Allen, Krumel, & Pollack, 130.

³¹ Ibid., 206. Excerpts from the PLAAF Officers Handbook mention the lack of a horizon and a pilot’s ability to maintain aircraft control makes over-water flight more hazardous.

the Su-27s purchased by China came without training manuals.³² The inability of the Chinese pilots forced Russian pilots to deliver the aircraft safely to China.

PLAAF employment doctrine relies heavily on older Soviet-style scripted maneuvers that are controlled by GCI (Ground Controlled Intercept) operators. China's limited ability to command and control forces further hinders the PLAAF's operational effectiveness. Minimal electronic countermeasure capabilities may be capitalized upon by an adversary capable of employing jamming assets, further degrading PLAAF capabilities to effectively employ air power.

China's air defense also relies upon surface-to-air missiles (SAM) and anti-aircraft artillery (AAA). Recent purchases include the Russian-built SA-10 SAM system. Probably deployed around Beijing, China purchased four SA-10B batteries in 1993 (100 missiles) and may eventually purchase twelve additional batteries of these missiles.³³ The newer SA-10B missiles have a 150 km range capability.³⁴ Although some of the systems are mobile, Chinese SAMs will not be of a large concern for air superiority over Taiwan, but they will be a factor for any attacks against mainland China or an attempt to gain air superiority over the Strait. Future acquisition of the Russian SA-12 *Giant* may tip the scales of an air superiority fight over the Strait, though, due to its nearly 100 km range.

China possesses about 16,000 AAA pieces that range from 12.7 mm to 100 mm in caliber.³⁵ These weapons are typically rugged, can fire from temporary locations, and are mobile, but are generally meant for lower flying aircraft. Both the SAM and AAA systems are hindered by the PLA ability to command, control, and integrate the different air defense assets. This limitation

³² *Jane's Sentinel*, "China," paragraph 1.15.5

³³ *Jane's Sentinel*, "China," paragraph 1.12.5.

³⁴ *Jane's Strategic Weapons Systems* (New York: Jane's Information Group, Jan 97), Issue 23.

³⁵ *Jane's Sentinel*, "China," paragraph 1.12.13.

will reduce the overall effectiveness of Chinese air defense by limiting the maximum number of engagements and possibly increasing fratricide to PLAAF equipment.

The offensive portion of the PLAAF consists of H-5 light and H-6 medium bombers. These aircraft are capable of carrying 1,000 and 3,000 kg bombloads, respectively, to ranges of about 1,000 NM.³⁶ Some of these aircraft have been modified to carry air-to-surface missiles, but primarily employ free fall weapons from an internal bomb bay. Neither of these aircraft will play a significant role in the air superiority battle. However, the H-5 and H-6 are the only Chinese offensive aircraft capable of reaching Taiwan and they support the Second Artillery Corps in China's limited force projection capability.

The PLAAF employs a doctrinal theory of "light front, heavy rear," to minimize its forward deployment weaknesses. In this employment theory, defenses are light at the Chinese border, then substantially increase as the attacker gets deeper into China.³⁷ The weakness in this theory is that Chinese air defenses cannot reach their own border and are mostly placed around the larger cities. Since most of the larger airfields are further inland, there is minimal need to defend the border areas against air attacks, yet many Chinese cities are near the borders or the coastline.

The PLAAF "light forward, heavy rear" doctrine limits China's ability to employ these same short-range aircraft from forward operating bases, minimizing Chinese force projection capabilities. There are forward operating locations, yet most of these are not able to sustain combat operations for logistical reasons. Of the 86 Chinese runways that are 8,000 feet or

³⁶ Jane's All The World's Aircraft, 1982-83, 39. The H-5 is the Chinese version of the Russian Il-28 *Beagle* light bomber produced in the 1950s and the H-6 is the Chinese version of the Russian Tu-16 *Badger* medium bomber, produced in the 1960s.

³⁷ Allen, Krumel, & Pollack, 114-115.

longer, most are located near the larger cities, with a few dispersed on islands supporting Naval Aviation.³⁸

PLA Navy

The PLA Navy (PLAN) is organized under the PLA like the PLAAF. Within the PLAN there is a separate aviation branch that is subordinate to the PLAN. The primary mission of PLAN Aviation is to liberate small islands currently under dispute with Taiwan and Japan.³⁹ For this reason, Chinese Naval Aviation is a key element in any proposed attack of Taiwan. One main reason for the lack of PLAAF support, other than previously noted range capabilities, is that the PLAAF does not train and fly over water. This makes basic aircraft control and navigation hazardous for PLAAF pilots.

The aircraft of the PLAN consist of the same generation of equipment as the PLAAF, but are modified to employ improved anti-ship weapons. During conflicts over the disputed islands (e.g., the Spratly and Parcel Islands), Chinese airpower will be mainly Naval Aviation, with most of the land attack and air superiority missions being flown by obsolescent J-6, J-7 and J-8 fighters. Except for its helicopters, PLAN Naval Aviation is a land based force.

The surface and sub-surface equipment of the PLAN is also obsolete, in most cases, when compared to US standards. Although a large force in numbers, the limited Chinese ability to develop indigenous technology has hindered their ability to provide an effective naval fleet.⁴⁰ Similar to the PLAAF, the PLAN has recently relied upon acquisition of Russian equipment to bridge the technology gap.

³⁸ CIA, 104.

³⁹ Allen, Krumel, & Pollack, 205.

⁴⁰ Paul H. B. Godwin, "The Chinese Communist Armed Forces," AU Press, June 1988, 124.

The acquisition of four *Kilo*-class submarines may provide the PLAN's best naval capability to employ against adversary naval assets, but such a small quantity will be a limiting factor. China has also purchased "two Russian *Sovremenny* class destroyers with their highly effective SS-N-22 'Sunburn' ship-to-ship missiles."⁴¹ These missiles provide a major conventional striking power for the PLAN, which could be used against adversary carriers.

The *Kilo*-class submarines are added to the PLAN fleet of 48 older submarines. Of those, two are ballistic missile submarines (one nuclear powered) and 47 attack submarines (five nuclear powered).⁴² The size of this fleet is its primary strength, while the presence of the *Kilo*-class submarines present a more complex problem for Taiwanese ASW assets. They are very quiet diesel electric submarines that are hard, but not impossible to detect.⁴³ China's nuclear powered submarine force is capable of staying at sea and submerged much longer than the diesel powered Taiwanese fleet of four attack submarines.⁴⁴

While the increased capability of these newly acquired assets is substantial, they are very limited in number and only incrementally enhance the ability of the PLAN to project offensive power. The long-term maintainability of the new weapons and vessels will require substantial investment of time and currency.

In comparison to other states in the region, China has a navy that is larger than all of the of Association of South East Asian Nations (ASEAN) countries combined, although some ASEAN countries have modern Western equipment, including anti-ship missiles.⁴⁵ This qualitative advantage of the smaller navies will adversely affect PLAN operations, yet Taiwan does not

⁴¹ "Country Briefing: China, Major modernisation sees slimmer giant," 25.

⁴² *Jane's Sentinel*, paragraph 1.13.12.

⁴³ *Ibid.*, paragraph 1.13.2.

⁴⁴ *Ibid.*, paragraph 8.13.14.

⁴⁵ Wortzel, "China and Strategy: China Pursues Traditional Great-Power Status," *Orbis*, Volume 38, No. 2, Spring 1994, 164-5.

have this advantage, due to the dual nature (offensive and defensive) of this equipment. The large PLAN fleet is one of the reasons that most ASEAN countries will stay out of a Chinese-Taiwan conflict.

China's limited sealift capability minimizes its force projection and amphibious landing abilities. On land, China can move large forces quickly and quietly. For an amphibious assault against Taiwan, China could use land-based PLAN and PLAAF aircraft based in the Nanjing Military Region. Yet the landing force would be only division-sized due to China's limited amphibious capabilities, and would be at risk from Taiwan's shore based defenses.

The PLAN has about 60 amphibious ships that together have the capability to land an infantry division on a beach, which can also be supported by a PLAAF airdrop of about 3000-4000 airborne troops.⁴⁶ The PLAN could muster a large quantity of merchant shipping to ferry an invasion force of up to 300,000 troops into a Taiwanese port, but these additional merchant ships would be highly vulnerable to attack.⁴⁷ This would require the ability to seize a major deep-water port and Chinese aviation forces would have to gain air superiority over Taiwan to defend the merchant shipping.

China's current procurement programs emphasize the *Kilo*-class submarines, main battle tanks and combat aircraft. The lack of amphibious capability is not a major issue yet, which provides some breathing time to prepare for a defense of Taiwan. Should the PLA change the focus of its procurement strategy towards an improved amphibious capability, then this should be seen as a sign of potential impending conflict.

⁴⁶ "Country Briefing: China – Out-dated logistics system overhauled," Jane's *Defence Weekly*, 10 December 1997, 31. It is also reported that the PLA has never conducted a division-scale or larger amphibious exercise, which would further limit its capabilities in an amphibious assault.

⁴⁷ Ibid., 32.

Major Modernization Efforts

China's major modernization needs to take place outside the military. There is a great growth potential in the industrial sectors, bringing in many technologies suitable for weapons application and gaining capital. While the need to modernize the PLA is great, it can not be done in significant quantity without a vibrant economy to support it. Continuing the Chinese move towards a market economy with improvements in the efficiency and privatization of the market will provide the economy needed to continue its growth.⁴⁸ If China's economy can make these changes and continue the spectacular growth rates of the past couple of years, then the PLA may indeed get to see much of its requested modernization.

One of the major military modernization steps is to change from a doctrine of "light forward, heavy rear" to a force projection oriented force. This change will allow the PLA to retire much of its outdated equipment (T-59s and J-6s). The downsizing will free up operating expenses and investment capital to accelerate the Chinese modernization process.

The PLA would be able to procure and employ better field equipment that might rival US standards. Downsizing the ground forces will make them more mobile, which will make the overall PLA capability better in the force projection role.

The PLAAF might be able to produce several hundred Su-27s once the production facilities are established in China. Other aircraft like the Su-30s may also begin to be substantially produced, alongside the F-10, if there are few additional delays. Chinese production allows for increased acquisition of these higher technology aircraft, yet they will remain a generation behind the US F-22 and the Joint Strike Fighter.

⁴⁸ Peter L. Young, "Asia's Economic Crisis – The Challenge of Containing the Damage," *Armed Forces Journal International*, February 1998, 28.

The PLAN may also continue to pursue acquisition strategies allowing for a faster paced modernization. Purchasing more *Kilo*-class submarines and follow-on improvements will continue to increase the gap between the PLAN and Taiwan Navy fleets. As a force projection enhancement, China is pursuing aircraft carrier capabilities. The PLAN has purchased Russian and British technology (along with the retired Australian aircraft carrier *Melbourne*) to study and train for carrier operations.⁴⁹ Although probably more than twenty years from deploying its first carrier, the PLAN is beginning to think like a projection force.

Table 1 compares China's current aircraft numbers against planned purchases and productions for the next twenty years. Note that the "available" rows (for both time frames) are significantly lower than the total possessed. That is because not all of the aircraft possessed are in a position to affect the conflict. Also of note, the 800 available fighters (in the Nanjing military district)⁵⁰ for use against Taiwan in 1998 may mislead strategists, since the Chinese sortie production rate of only one sortie per aircraft for every four days is well below western standards.⁵¹ A western equivalent of this number would be closer to 200 fighters available.

Table 1. Chinese Aircraft Modernization.

PLA Aircraft	Fighters	Lt-Med Bombers	SAM Systems
1998 Total ⁵²	4,500	470	114
Available ⁵³	848	210	16
2018 Total ⁵⁴	1,700	400	130
Available	600	190	20

⁴⁹ *Jane's Sentinel*, paragraph 1.15.6.

⁵⁰ Julia A. Ackerman, and Michael Collins Dunn, "Chinese Airpower Revs Up," *Air Force Magazine*, July 1993, 58.

⁵¹ *Jane's Sentinel*, paragraph 1.12.2.

⁵² *Jane's Sentinel*, paragraphs 1.12.11 and 1.13.13.

⁵³ Available in this scenario means that the aircraft are based close enough in range to be used against Taiwan, either in an air superiority role or in a ground attack role.

The 848 aircraft available in 1998 include the 48 Su-27s currently possessed by the PLAAF. Although the number of fighter aircraft available in 2018 is reduced to 600, all of these aircraft will be modern (by Chinese standards) and are postulated to be capable for use against Taiwan. As a result, in 1998, China could employ about 248 fighter sorties per day against Taiwan and in 2018 that number increases to 600 sorties per day. China has no plans evident that show priority for replacement of its aging and antiquated light and medium bomber force.

Summary

Chinese military capability has long been oriented towards large-scale land conflicts and border wars. For this type of battle, China has developed a military structure that is land-centric. There is a great need for modernization of all branches of the PLA. While this task would be extremely tough on a modern western economy, it may well be out of reach for China in the next two or three decades.

The Chinese economy is showing signs of continued growth that might provide the baseline for sweeping modernization, yet most Western economists caution the public about long-term predictions. If China's economy stops increasing at the current rate, then much of the PLA modernization will come under severe scrutiny. The Asian economic crisis of the late 1990s has added much speculation about Asia's economic future. China is vulnerable to instability within her own borders, as many public enterprises are failing, which in turn will put millions out of work. This batch of unemployed will be added to the millions currently unemployed and the millions more who are significantly underemployed.⁵⁵ This could add to pressures for more democratization and to greater unrest.

⁵⁴ This estimate takes into account planned Chinese acquisitions and the planned production of modern aircraft within China, such as the F-10 and Su-27 and assumes the retirement of aircraft after forty years of service.

⁵⁵ Young, 28.

To make significant modernization steps, China needs an economy that is as good as the most optimistic current forecasts. Anything less will require the PLA to modernize its forces only incrementally. China has been growing economically at a rapid rate, yet to sustain this growth, China needs to restructure its economy by moving towards an open market society.⁵⁶ Some US agencies caution that the World Bank estimate may overstate China's economic growth by as much as 25 percent.⁵⁷ An overestimation of this magnitude may spell disaster for the PLA modernization program. Yet, China does not have to modernize its entire military force to invade Taiwan.

If Taiwan appears to be moving towards independence, conflict may become inevitable. China has shown a willingness to wait a long time for the defense modernization required that would give her the ability to militarily control/invoke Taiwan. The next step in this research is to assess Taiwan's ability to defend itself against a huge enemy less than 100 miles across the water.

⁵⁶ International Monetary Fund, World Economic Outlook, October 1997, a Survey by the Staff of the, 2.

⁵⁷ CIA, 104.

Chapter 3

Taiwan's Military Strength

Taiwan's indigenous capability to defend against a direct attack from China depends on the nature of the attack and the size of the invasion or assault. China's military action against the Republic of China (ROC – Taiwan) could take the form of a blockade, direct or indirect attack, or an invasion. While China may only be able to use a portion of the PLA to project power against Taiwan, Taiwan must commit all of its military forces to defend against a major cross-strait attack. Taiwan's military will be discussed in the same order as China's in the previous chapter, with the ground forces first, followed by the air forces, and then the maritime forces.

The command relationships of the Taiwanese military are similar to those of the United States. The President of the Republic of China (ROC) is the commander-in-chief of the military and has a Minister of Defense responsible for day-to-day military matters. The Chief of the General Staff reports to the President for operational matters and to the Minister of Defense for administrative matters. Each of the services' senior ranking general reports to the Chief of the General Staff. Table 2 shows a simple comparison of forces between China and Taiwan as of 1997.

Table 2. China – Taiwan Force Comparison.⁵⁸

	Military Personnel	Armored Vehicles	Combat Aircraft	Major Naval Vessels	Ballistic Missiles	Nuclear Weapons
China	2,972,000	20,572	5,890	396	146+	300+
Taiwan	360,000	2,050	300+	93	N/A	None

Taiwan's Land Forces

Ten infantry divisions, two mechanized infantry divisions, two marine divisions, two airborne brigades, six independent armored brigades, one tank group and two aviation groups form the bulk Taiwan's active land forces.⁵⁹ The reserve force consists primarily of seven light infantry divisions.

The heavy forces employ 200 M60A3 main battle tanks (MBT) and 574 M48 MBTs (M48H and M48A2/A3/A5)⁶⁰. These tanks are well supported by artillery. The M48 MBT was developed in the early 1950s and started production in 1952.⁶¹ The US Army continued to use M48 variants as its primary field armor until replacement (with M60s) began in 1960. Improvements on the M48's capabilities continued through 1988 by Taiwan,⁶² keeping pace with China's T-59 MBTs.

The newer M60 MBT was based on the M48 design with improved operational capability, mobility and decreased logistics requirements.⁶³ Deliveries of the M60 to Taiwan totaled 160 tanks by 1996⁶⁴.. Although a generation behind the US Army's M1A1 MBT of the 1990s, the

⁵⁸ *Jane's Sentinel*, "Taiwan," paragraph 8.07.1. N/A: Not available or numbers not known. The table lists China's nuclear weapons as N/A, yet in paragraph 1.10.5, there is a US Defense Intelligence Agency estimation that China has deployed 300 nuclear warheads.

⁵⁹ *Jane's Sentinel*, "Taiwan," paragraph 8.11.1 and 8.13.4.

⁶⁰ *Ibid.*, paragraph 8.11.10.

⁶¹ *Jane's Armor and Artillery*, 1997, 151.

⁶² *Ibid.*, 119.

⁶³ *Ibid.*, 148.

⁶⁴ *Ibid.*, 151.

M60 is a formidable weapon when facing current Chinese armor, like the Chinese Type 85-II MBTs. Future improvements to these tanks and possible contracts to acquire M1A1 MBTs from the US will continue to improve Taiwan's ability to mount a ground defense.

Taiwan's air defense forces employ a variety of surface-to-air missiles (SAMs). The most recent addition is the Modified Air Defense System (MADS) based on the US Patriot, which is in the process of being delivered to Taiwan."⁶⁵ This provides increased capability to engage ballistic missiles and higher altitude aviation assets.

The modified Patriot system is added to or replaces portions of an already established network of Nike Hercules, Tien Kung⁶⁶, I-Hawk Phase III and Chaparral SAMs.⁶⁷ These SAM systems provide an overlapping air defense that provides Taiwan with a lethal anti-air capability. When combined with air defense fighters, Taiwan has the ability to contest Chinese air superiority over Taiwan proper and possibly over the Taiwan Straits. Employing the Taiwanese combined SAM system, supported by early warning and air defense aircraft, Taiwan could stop any airborne assault that China could present at this time.

Taiwan Air Force (TAF)

In a situation similar to the land forces, Chinese air assets significantly outnumber Taiwan's Air Force and any perceived technological edge is diminishing. The most numerous aircraft in Taiwan's inventory is the F-5E, although the entire fleet of 270 is being sold to other countries.

⁶⁵ Raytheon, <http://www.raytheon.com/PatriotResponse.html>, 25 Mar 1998, 3.

⁶⁶ Chong-Pin Lin, "The Military Balance in the Taiwan Straits," *The China Quarterly*, June 1996, 579. Deployed in 1992, the Tian-gong was developed in Taiwan and is a radar homing, all-aspect all-weather SAM.

⁶⁷ *Jane's Sentinel*, paragraph 8.11.13. Taiwan has 200 MADS missiles on order and possesses 600 Tien-Kung SAMs. The air defense net also includes one battery of I-Hawk Phase III missiles, with 4 more being delivered.

These aircraft are to be replaced by 150 F-16A/B (Block 20), 60 Mirage-2000-5s and 130 locally manufactured Ching-kuo multi-role fighters.⁶⁸

Prior to China's acquisition of new Russian Su-27 fighters, the F-5E provided a slight technological edge over Chinese aircraft. The current Taiwanese acquisitions provide aircraft that are comparable to the Su-27 in air-to-air capabilities.⁶⁹ The biggest ROC advantage will be in quality pilots and logistics.

Taiwan conducts pilot training in a manner very similar to the US. Some of the pilots are trained within the United States, some in France (Mirage 2000 pilots), while others receive their training in Taiwan. Taiwan also sent pilots to Ukraine to study and learn to fly the Su-27.⁷⁰ This hands on knowledge will provide a large advantage to ROC pilots battling Chinese Su-27s. To ensure that Taiwan maintains the advantage for the foreseeable future, training is a primary focus for the Air Force. Taiwanese pilots study the newer Chinese aircraft in detail and set up training scenarios that will increase their ability to fight against the Su-27.⁷¹

Taiwan's planned purchase of 340 new fighters provides a quantitative edge over China's 48 Su-27s⁷² (24 more have been purchased, but not yet delivered), but this lead may not last. If China's economy allows for increased weapons acquisition, then Taiwan will have to rely on increased technology, by procuring aircraft like the F-22 or Joint Strike Fighter (JSF), rather than larger numbers to achieve or maintain air superiority over Taiwan. Taiwan is limited in geographic size and in its capability to maintain large numbers of aircraft.

⁶⁸ Ibid., paragraphs 8.12.2 and 8.12.11.

⁶⁹ Wortzel, "China and Strategy: China Pursues Traditional Great-Power Status," *Orbis*, Vol.38, No. 2, Spring 1994, 170.

⁷⁰ *Jane's Sentinel*, paragraph 8.12.8.

⁷¹ Ibid., paragraph 8.12.2.

⁷² *Jane's Defense Weekly*, 10 December 1997, 27.

The defensive nature of the TAF and the dual use capability of stealthy aircraft like the F-22 and JSF may limit Taiwan's ability to acquire such US assets. The high cost of these systems may also prevent Taiwan from procuring enough of these newest aircraft to meet the need, even if the United States was willing to sell them.

The TAF has the aircraft and ability to attack targets in China. During a conflict, the TAF may be tasked to attack Chinese airfields in the Nanjing military district and some of China's major ports. The goal of these attacks would be to limit China's ability to project airpower over Taiwan and to hinder the PLAN's blockade or invasion strategy. The F-16s and Mirage 2000s that are replacing the F-5s will increase Taiwan's ability to attack mainland targets. The TAF is primarily a defensive force, but the new additions provide an offensive potential.

There are twenty airfields with runways that are 8,000 feet or longer in Taiwan.⁷³ TAF aircraft are spread among these airfields, providing some survivability in the face of the Chinese SOF and ballistic missiles threats. In February 1991, Taiwan completed an underground air force base, where "200 fighters can taxi from this protection out to a runway on the east side of the central mountains."⁷⁴ This shelter provides protection from conventional ballistic missiles and bomber attacks, but may also be the center point of attention for Chinese SOF activities.

Taiwan's ability to exert force against Chinese mainland targets is increased by the new acquisitions, yet Taiwan's suppression of enemy air defenses (SEAD) capabilities is sorely lacking. To attack China, Taiwan must either employ stand-off weapons (which are not being procured) or fly within Chinese air defense threat rings. The Chinese air-to-air threats may be somewhat weak, but their SAM and AAA defenses are advanced and fairly dense, limiting the TAF's ability to attack mainland targets.

⁷³ CIA, *The World Factbook*, 554.

⁷⁴ Lin., 579.

As long as Taiwan maintains a quantitative advantage over Chinese Su-27s, it should be able to maintain air superiority over Taiwan and the waters to the east. Air superiority allows Taiwanese anti-surface and anti-submarine assets to perform sea-control missions, in the Pacific, severely hampering the effectiveness of a Chinese blockade.

Taiwan's ability to contest air superiority over the strait is also improving with the recent addition of an airborne early warning (AEW) capability with the delivery of four E-2T aircraft, similar to US Navy's Hawkeye aircraft.⁷⁵ This addition will provide Taiwan the ability to detect aircraft that are still over mainland China, increasing the time available to position defensive forces, while also enhancing their effectiveness. The E-2T aircraft also provide air and surface activity information to the Taiwanese Navy, supporting the surface scheme of maneuver.

The Chinese and Taiwanese SAMs will increase the difficulty of both sides to gain air superiority over the Strait. Both sides have SAM systems that reach almost all the way across the Strait. An effective SEAD campaign may be the factor that gives either side the winning edge.

Any invasion attempt of Taiwan must be preceded by gaining air superiority over Taiwan and the Taiwan Strait. China's ability to contest air superiority over Taiwan lies within the Nanjing military district, where the airfields are close enough in range to Taiwan for the older Chinese aircraft to reach Taiwan. Without the airfields, China will not be able to contest air superiority over Taiwan in the near future. Therefore, all Taiwan must do to maintain air superiority over Taiwan is to successfully attack the Nanjing airfields, which will require gaining air superiority over the Strait.

⁷⁵ *Jane's Sentinel*, paragraph 8.12.2.

Taiwan's Naval Forces

The Taiwan Navy (TN) provides maritime defense for Taiwan proper and resupplies Taiwan's island possessions. The TN consists of four attack submarines, 18 destroyers, 17 frigates, three corvettes and 51 fast attack craft (missile). However, the TN is severely outnumbered when compared to Chinese naval forces. Further increasing the problem is the fact that the Chinese Navy also has the technical advantage with nuclear powered submarines.

China has 47 attack submarines, five of which are nuclear powered.⁷⁶ The newer Kilo class submarines are diesel powered, yet are much more high-tech and capable than the Taiwanese attack submarines. The PLAN advantage will increase the difficulty Taiwan ASW assets will face in accomplishing their mission.

Taiwan's biggest constraint in acquiring better submarines is that they are viewed as offensive in nature. The United States has limited the sales of improved submarines to Taiwan because of their offensive capabilities.⁷⁷ Taiwan has stated the need for improved submarine technology for defensive purposes. Considering the increased threat to Taiwan by the Chinese acquisition of Kilo class submarines and the small size of the TN submarine force, the need appears to be reasonable. One possibility is for Taiwan to purchase advanced submarines from Germany, the United Kingdom or France, if the United States continues in its reluctance to sell submarines abroad. In an attempt to assure their defensive mindset, Taiwan has stated that it does not intend to acquire an aircraft carrier, even if China does.⁷⁸

Most of the TN fleet is old, when compared to US standards, yet is sufficiently advanced to defend against a similarly sized opponent with the current level of Chinese technological

⁷⁶ *Jane's Sentinel*, paragraph 1.13.12.

⁷⁷ *Jane's Sentinel*, paragraph 8.15.6.

⁷⁸ *Ibid.*, paragraph 8.15.6.

capability. The larger size of the Chinese Navy will require the TN to rely upon support from the TAF and shore based systems, however.

Four squadrons of surface-to-surface missiles (Hsiung-Feng II) support the coastal defense mission. These missiles are indigenous to Taiwan and are capable of penetrating surface ship defenses when used in conjunction with air and sea attacks. Taiwan also employs a number of 127mm guns, deployed on the main island and Penghu, to provide a layered defense.⁷⁹ Although the guns are short range defenses, they complicate ship defense problems because they are not affected by electronic counter measures.

The TN's ability to control sea lines of communication, making a blockade ineffective, relies on the ability of the TAF to gain air superiority. With Taiwanese air superiority, the TN can engage Chinese submarines with capable ASW assets, using surface ships and helicopters.

Taiwan also has an active Marine force assigned to the Navy, consisting of two Marine divisions that are based at Tsoying and on the southern portion of the island. There are also Marine detachments at Pratas and the Spratly islands in the South China Sea.⁸⁰ Similar in function to US Marines, the Taiwan Marines are lightly armed and amphibious capable. The resources that are expended to have a capable Marine force are justified by Taiwan's many ongoing island and territorial disputes. These forces would be used to defend against an amphibious assault on Taiwan or on the disputed islands currently controlled by the ROC.

Chinese Threat

A blockade of Taiwan, both militarily and diplomatically, would likely be China's first course of action in most major conflicts. Taiwan's ability to survive would depend on its ability

⁷⁹ Ibid., paragraph 8.13.5.

⁸⁰ *Jane's Sentinel*, paragraph 8.13.5.

to defeat the blockade, allowing the economy to continue to function and the military to be resupplied. Keeping the SLOCs open east of Taiwan would minimize the effects of the blockade.

The first step in keeping the SLOCs open in the east would be to gain (or maintain) air superiority, allowing the TN to accomplish sea-control missions, including ASW. The ability to contest air superiority requires the TAF to fly from airfields on Taiwan. This would require ground defenses against Chinese SOF forces and air defenses to render Chinese missile attacks non-effective. If Taiwanese forces were not able to break an attempted blockade, then the PRC might be able to achieve its objectives after a long period of time.

Once the blockade had been rendered ineffective, Taiwan might have to defend against a land invasion from China. Air superiority would allow attacks against surface shipping that China would use during an invasion. The TAF and TN would be used to hold landing forces at bay and attrit Chinese forces as they advanced. Next, land forces and shore defenses would attack the invasion forces when they get into their respective ranges.

Taiwan's large infantry forces would primarily be used to defend against China's SOF forces already in place or inserted just prior to and during the conflict. The major goal of the Taiwan land forces would be to ensure that the airfields, air defenses and naval ports remained operational. This will be the biggest factor for winning a larger conflict against Chinese forces.

Major Modernization Efforts

Taiwan's stated first priority for military modernization is the acquisition of new submarines⁸¹ to offset the PLAN advantage of numbers and technology. Although the United States will not sell submarines to Taiwan, there is a possibility that in the future a deal may be

struck. Taiwan also has the opportunity to buy from other submarine producing countries, like Germany, the United Kingdom and France.

The next priority is to continue air defense modernization, including TAF and land-based air defenses. The ongoing acquisition of a modified Patriot defense and the locally produced Tien Kung SAM will assist the TAF in maintaining air superiority over Taiwan, and to contest air superiority over the strait. Table 2 shows a comparison of the military vehicles, aircraft and vessels between China and Taiwan today.

Yet as both sides modernize, the balance may change in one direction or the other. Just as China is economically restrained, Taiwan also faces similar constraints. The priorities that will be set for Taiwanese modernization will be affected by the Chinese modernization forecasted in Table 1 (in Chapter 2). Regardless of China's land modernization efforts, the PLA must be able to project that force onto Taiwan. PLAN modernization may increase the possibility of China launching a successful blockade or invasion of Taiwan. PLAAF modernization, which might enable Chinese air superiority over Taiwan, is the enabler for either of these forces to accomplish their mission, and may also be able to sufficient to force Taiwan back under Beijing's control.

Taiwan will continue to improve its major combat equipment, yet when all is said and done, PLA forces will outnumber Taiwanese forces roughly seven to one.⁸² Although China will only bring a portion of these assets to bear, Taiwan can expect to be outnumbered in a conflict against China. But Taiwan will fight a defensive war, may not fight alone, and may have range advantages for the majority of the engagement zone. Defense spending in Taiwan is already very high and is unlikely to increase. The recent Asian economic crisis will also have adverse effects on Taiwan's economy, further hurting their defense acquisition programs.

⁸¹ *Jane's Sentinel*, paragraph 8.15.6.

⁸² Lin, 585.

To defeat Chinese forces in battle, Taiwan must be able to defend against a missile threat, air attacks, a naval blockade and an amphibious invasion. Modernization of its land forces may decrease the Chinese chances of a successful amphibious invasion, but do little about the other threats. TN modernization may allow Taiwan to defeat a blockade attempt and decrease China's chances for a successful amphibious invasion, but still leaves the missile and air threats unchecked.

Modernization of the Taiwanese air defenses may reduce China's ability to employ missile and air threats over and across the Strait. If China does not have the ability to gain air superiority over the Strait, let alone over Taiwan, then an amphibious invasion is at risk. Taiwan's air, surface and sub-surface forces will be able to operate more efficiently against an attempted invasion. Likewise, a naval blockade without air superiority would be a risky proposition.

Summary

Taiwan is significantly outnumbered when compared to China. The technical advantage that Taiwan has enjoyed for the past twenty years is rapidly dwindling. Taiwanese forces are restricted from procuring some equipment, such as modern submarines, due to the potentially offensive nature of the weapon systems, and potential sellers' desire to maintain good relations with Beijing.

However, Taiwan's current combat aircraft and air defense systems are numerous enough to ensure air superiority over Taiwan. China's 248 fighter aircraft available (Nanjing district fighters plus the Su-27s) that can currently engage in an air superiority battle over Taiwan are not sufficient to gain air superiority for China. China's lack of air superiority enables Taiwan forces to conduct ASW operations and to defend Taiwan from an amphibious invasion. In 2018, though, the situation changes significantly. China may be able to employ 500 modern aircraft

(Su-27s, F-10s, and Su-30MK fighters), plus its aging fleet of light and medium bombers against Taiwan. These forecasted changes place Taiwan and China on an equal footing in quantity and quality, placing Taiwanese air superiority in doubt.

The people of Taiwan have enjoyed most of the benefits of independence and are relatively happy with the status quo. Taiwan has become one of China's biggest trading partners.⁸³ As China modernizes the PLA and attempts to become a world power, there may be a resurgence to consolidate power at home, fueling the chances for a conflict with Taiwan. Taiwan is dwarfed by the PRC and has a vaguely worded US Senate Resolution to fall back on for protection. There are some serious deficiencies for Taiwan's defense appearing on the horizon as the PLA modernizes.

In accordance with the 1979 agreement, the US is likely to defend Taiwan against a Chinese assault. The next chapter will discuss what the US can do to best assist Taiwan and what capabilities the US must possess to ensure adequate support to Taiwan.

⁸³ CIA, 554.

Chapter 4

United States Responses for Taiwan's Defense

Through the Taiwan Relations Act of 1979, the United States has stated that it will protect Taiwan from Chinese aggression. However, what does “protect” mean? The ambiguity of this commitment leaves the door open for many possible responses or options in the event of a threatened or actual Chinese invasion. This chapter will discuss the available options, ranging from diplomatic pressure to invasion of the Chinese mainland.

Diplomatic Pressure

Diplomatic pressure through the United Nations Security Council to derail a Chinese invasion of Taiwan will be of little use, since China is a permanent member of the Security Council with veto power. Other avenues, such as a global or regional coalition, would have to be the location for a unified application of diplomatic pressure.

US trade sanctions, including revoking China's most favored nation (MFN) status, would be a small but significant threat. “Beijing remains conscious of the need to develop the economy and infrastructure” to keep its economic recovery going.⁸⁴ This threat alone may be enough to deter Chinese aggression, but once the aggression has already started, it is unlikely that trade sanctions would have a significant impact. China would expect US trade sanctions as a

⁸⁴ Wortzel, “China and Strategy: China Pursues Traditional Great-Power Status,” *Orbis*, vol. 38, no. 2 (Spring 1994), 160.

minimum and would be prepared to withstand such actions, or it would not invade in the first place.

Sanctions against China will also reduce China's ability to become a world power, but may not be sufficient to defend Taiwan in the future. In the time that would elapse while the sanctions are taking effect China may have the ability to overwhelm Taiwanese forces through attrition warfare, and gain possession of Taiwan. In the next twenty years, it is impossible to say how the world would react to an aggressive China "reclaiming a renegade province," yet it seems clear that the US promise of protection to Taiwan will not be adequately serviced through diplomatic means alone.

Blockade of China

China has about ninethousand miles of coastline and borders fifteen other countries, including Russia.⁸⁵ Attempting a blockade against a country similar in size to the US, and with many different national borders, would be next to impossible. Blockading such a long coastline would require much effort to enforce, not to mention the resources required to implement a land blockade. Countries such as Russia, North Korea, Burma and India would need to support the blockade if it were to be successful.

China's leading trade partners are Japan, the US, Germany, South Korea and Singapore.⁸⁶ Although the isolation of China might be manageable with these countries' cooperation, the delicate balance of the economies in Asia would be devastated. The long-term effects of this action might even be worse than a shorter, violent conflict.

⁸⁵ CIA, *The World Factbook*, Washington: Brassey's, 1997, 102.

⁸⁶ CIA, 104.

A blockade that attempts to deny China's access to the Taiwan Strait might lead to an escalation of hostilities. The length of time required to establish a blockade, assuming it could be effective, would do little for the protection of Taiwan. If a blockade was the only US response and was instituted after hostilities began, China would have the needed access of the Strait and could use attrition warfare to invade Taiwan and obtain its objectives prior to the effects of the blockade having an impact.

Having US-Taiwan forces in place and ready to impose a blockade prior to hostilities commencing might deter Chinese aggression. A blockade of this nature could only eliminate Chinese access across the Strait of Taiwan. US forces needed for this action would include airpower assets to gain air superiority and naval combatants to augment Taiwan's naval forces to enforce the blockade. These same assets would also form the baseline of US forces deployed to the region in preparation for an armed conflict to defend Taiwan.

Defense of Taiwan

Today, Taiwan possesses the minimum forces necessary to defend from a Chinese invasion. A Chinese invasion of Taiwan would require all of China's most modern aircraft (e.g., Su-27s) and their entire fleet of about 60 landing craft⁸⁷ just to attempt a division-sized landing. In the next twenty years, as China continues to modernize and increase her amphibious forces, the problem will become more acute for the Taiwanese.

US air, land and sea forces could be deployed to keep Chinese forces from gaining a foothold on Taiwan, if we deployed before the attack. Gaining (or maintaining) air superiority

⁸⁷ *Jane's Defence Weekly*, vol. 28, no. 23 (10 December 1997), 31. Although they could mobilize merchant shipping to transport a much larger sized force, this other shipping would be extremely vulnerable to Taiwanese aircraft and shore-based defenses.

would allow coalition⁸⁸ forces to concentrate against any attempted Chinese invasion. Indigenous Taiwanese forces are very capable in anti-surface and sub-surface warfare. The side that has air superiority will be able to exploit it to either force a successful invasion (China) or prevent an invasion (Taiwan and the US).

The focus of US and Taiwanese use of force would be against Chinese military targets that are directly involved in the invasion. As noted earlier, China would not be able to use a large portion of its military in an attempted take-over of Taiwan. Those forces that are being used would be at risk from coalition forces.

This type of defense does not rule out offensive attacks by coalition forces against Chinese military targets. The object of these attacks would be to directly reduce China's ability to invade Taiwan. These attacks would not include strikes against the Chinese economy, strategic forces or infrastructure, unless they are being used to directly influence the Taiwan conflict, such as threatening China's economic stability for a drawn out conflict.

Targets in China that would require destruction or suppression include the airfields in the Nanjing military district (Fozhou and Ziamen) that would support fighter operations, the SAM sites that degrade the US-Taiwanese ability to gain air superiority over the Strait, and amphibious forces used to mount an invasion. Other military targets include airfields deeper in China that support light and medium bombers and Su-27 operations. The supply lines and depots that provide the needed logistics for the conflict would also be at risk, pending political will and strategic escalation options.

A counterforce defensive strategy would defend Taiwan from invasion, without threatening the existence of mainland China. There is a risk of escalation, yet clearly stated objectives may

⁸⁸ Coalition is used here to denote US, Taiwan and any other countries that would be supportive of such a defense of Taiwan. Likely candidates include Britain, Japan and possibly Russia. The interest of the coalition, outside the

limit this possibility. This approach would meet the intentions of the US and Taiwan, by defending Taiwan and ensuring a continuance of the status quo.

Twenty years from now, the US will be required to deploy airpower that is capable of gaining air superiority over Taiwan and the Taiwan Strait and conducting offensive attacks against Chinese military targets. These attacks would be directed against Chinese military forces capable of battling for air superiority over Taiwan and the Taiwan Strait and against PLAN ports and shipping likely to be used in an invasion attempt. Most of these targets are in the Nanjing and Guangzhou military districts.

The US forces used in the defense of Taiwan will have to operate from Guam, USN aircraft carriers, and possibly from other US bases in countries like Japan, South Korea and possibly Taiwan itself. The employment of offensive forces from foreign soil may not be approved in time to be of assistance, if it is approved at all. US forces probably will not deploy to Taiwan prior to initiation of hostilities for many valid political reasons, including the “one China” policy. Deployment to Taiwan after the beginning of the conflict would necessarily be under combat conditions, reducing logistical capabilities due to the increased threat.

The fast pace of combat operations will require the US to deploy combat aircraft to Guam prior to initiation of hostilities beginning, to ensure the ability to maintain air superiority over Taiwan and the Taiwan Strait. Waiting for the approval from other countries for offensive operations may cost the US and Taiwan the ability to maintain air superiority. Prepositioning of supplies at Andersen AB (Guam) would reduce the time and assets required for US forces to deploy there and begin combat operations.

defense of Taiwan, might be to ensure that China does not gain hegemony in the ASEAN region.

Strategic Disarmament of China

Employment of US forces to defend Taiwan might also be expanded to enable a conflict with an outcome of a strategically less capable China. Although China has been a nuclear capable power since 1964, Chinese technology and capability to employ nuclear weapons is limited.⁸⁹ As China continues to modernize its strategic force structure, these range and accuracy problems will be incrementally reduced. The window of opportunity to strategically disarm China is closing, or may have already closed.

Attacks against Chinese strategic missile forces could severely reduce China's ability to employ weapons of mass destruction, but unless every storage site, every deployed weapon, and the entire scientific knowledge base of China's WMD program were successfully destroyed, then China will have the ability to rebuild it over time. The additional forces required to make these attacks (e.g., TLAMs and B-2s), would not ensure that the goals were achieved. Also, attacks of this nature would certainly seem to threaten China's sovereignty, increasing the chance of escalation of the conflict outside the defense of Taiwan.

China has the ability to employ WMD against targets sets and locations that may significantly hinder coalition capabilities to achieve their objectives. Any attempt to strategically disarm China would require increased deployment of US assets and, at a minimum, basing support and rights from US allies in the region, like Japan and South Korea. Technological improvements in the next twenty years may increase our ability to find and destroy WMD sites, but the probability of destroying all of these sites will still be extremely low.

⁸⁹ *Jane's Sentinel*, paragraph 11.10.5. China has detonated 43 nuclear weapons through August 1995, yet still has problems miniaturizing the warheads, limiting employment capabilities. Many of the 300 Chinese nuclear warheads are delivered by short to medium range systems (missiles or aircraft) and have poor accuracy. Some of the Chinese nuclear missiles are long range and can threaten portions of the continental United States.

This approach would meet the US objectives of defending Taiwan, by maintaining air superiority as in to the previous situation and defending against an invasion by China. Either during or after the defense of Taiwan, the coalition could begin the attacks to strategically disarm China. However, the successful outcome of these attacks is in doubt, especially without increasing the chance of broadening the war.

A limited attack aimed at reducing China's military capability to project force across the strait is another option. Destroying the ports and airfields in the Nanjing and Guangzhou military districts would significantly, but only temporarily, reduce China's ability to threaten Taiwan, but would not completely eliminate the threat. In addition, China's missile force has the range to strike Taiwan from many parts of China and can threaten Taiwan unless it is eliminated.

Continental Invasion of China

The least likely possibility would be to employ US forces not only to defend Taiwan, but to ensure a long-term settlement including a land invasion of China. The initial defense of Taiwan would be similar to the counterforce strategy, but there would need to be an increased force buildup for the invasion. Objectives in addition to the defense of Taiwan might include the long-term reduction of China as a world power and a chance to increase US influence in the region.

The primary objective of any continental invasion of China would be to seize a part of China to ensure the long-term survival of Taiwan. The United States and probably the UN would need to determine either how the seized territory would be returned to China or who would govern and control the territory.

The major problem with this approach is that it would play into China's major strength, that of a land based surface power. As large as China is, any attempt to invade her would be met with a significant contingent of the PLA and would require a vast force. As noted earlier, these

forces are antiquated, yet they are very large in number. A major coalition loss in an attempt to invade China would also weaken its ability to defend Taiwan.

Escalation of the conflict to nuclear warfare would also be a major concern. China would feel most threatened by this approach and would presumably employ all means available to ensure its survival. The increased risk to coalition forces and other targets (e.g., population, military and industrial centers) within reach of China's ballistic missiles would be hard to justify. This increased risk might also alienate many potential coalition partners that Taiwan and the US would want for such an invasion. Additionally, US targets would be at risk too.

A benefit from this option, if successful, would be to enable Taiwan's old objective of a single China, governed by Taipei. Since 1949, when Taipei lost control of China, the goal of a unified China under Taipei's rule has slowly diminished. Most Taiwanese are content with the status quo, a Taiwan that controls their own affairs.⁹⁰ The enormous effort that would be required by the coalition, the limited probability of success and the reduced Taiwanese desire to govern all of China effectively eliminate a continental invasion of China as a possibility.

Summary

There are many options that the US could chose in a response to an attempted Chinese invasion of Taiwan. The five discussed here cover the spectrum from very low to very high intensity. They are not meant to limit the choice of options, but to provide a baseline for determining what meets the objective, is worth the risk and is capable of being accomplished. Of these five scenarios, the Blockade of China and the counterforce Defense of Taiwan options involve a plausible amount of force application and meet the objective. The non-military options do not meet the objective, and would allow China to capture Taiwan. The Strategic

Disarmament option and the Continental Invasion of China option are far too expensive and dangerous, and may not even be possible in the twenty-year time frame studied.

The remainder of this research examines the ability of a US-Taiwan coalition to defend Taiwan along those lines. The intent of this strategy is to minimize attacks on mainland China, so as to reduce the chance that China will perceive the conflict as threatening to the survival of China, yet to ensure the defense of Taiwan.

⁹⁰ *Jane's Sentinel*, paragraph 8.8.10.

Chapter 5

United States Requirements for the Defense of Taiwan

A counterforce defense of Taiwan against a Chinese invasion depends on the US ability to project force. This chapter looks at the current defense requirements for Taiwan, and then extrapolates future defense requirements from established trends. This will provide the requirements that the USAF needs to meet in the next twenty years to be able to accomplish this specific mission.

Current and Near Future Situation

Today, Taiwan possesses adequate military strength to defend itself from a Chinese invasion.⁹¹ The numerical parity between the aircraft that Taiwan can employ (300+ fighters) and those that China could offensively employ (about 410 fighters and light or medium bombers) means that air superiority would go to the side with better training and equipment. Taiwan's advantage as the defender is that air combat should occur over or near Taiwan, allowing Taiwanese SAMs to enter into the equation. As China continues to modernize, though, this parity may change.

Taiwan requires little more than air superiority to repel a Chinese invasion. Air superiority would provide Taiwan the ability to defeat a Chinese blockade, allowing Taiwan to sustain

⁹¹ Feldman, "The Likely International Response," Chapter 5 in Chang and Lasater's *If China Crosses the Taiwan Strait: The International Response* (New York: University Press of America, 1993), 75.

combat operations. It would also allow naval and air power to conduct anti-submarine and anti-surface operations, further opening the supply lines and reducing the PLAN ability to protect its amphibious landing ships. Attacking amphibious shipping in the Strait, prior to the force reaching Taiwan requires Taiwan to at least dispute air superiority over the Strait, similar to the Battle of Britain and the proposed German invasion of England (Operation Sealion).⁹²

China's extensive ballistic missile capabilities are currently reduced by Taiwan's Modified Air Defense Systems (MADS). MADS is a modified missile system based on the US Patriot missile, approved for sale by the US government in 1993. This missile system is an upgraded version of the Patriot missiles used in Desert Storm.⁹³ Future improvements to the Patriot missiles and follow-on systems will increase our capabilities to defend against theater ballistic missiles. This will help Taiwan offset Chinese modernization efforts in missile and aircraft forces.

Once completed, Taiwan's procurement of advanced fighters will provide the needed numbers and qualitative advantages to maintain air superiority on the east side of Taiwan, and to dispute it over the strait. As China's modernization continues, however, Taiwan will need to increase its air superiority capability. This increase can be in quality or quantity. China's investment in 72 Su-27s⁹⁴ will not be enough to defeat Taiwan's upgraded Air Force once deliveries for both sides are complete, around 1999.⁹⁵ If China's modernization overtakes Taiwan's modernization, however, then the US will have to provide support to Taiwan to ensure US-Taiwanese air superiority.

⁹² For more information on the Battle of Britain, see R. J. Overy, *The Air War: 1939-1945*, pp. 31-38 or Robin Higham, "The Royal Air Force and the Battle of Britain" in *Case Studies in the Achievement of Air Superiority*, ed. Benjamin F. Cooling (Washington DC, Center for Air Force History, 1994), pp. 115-178.

⁹³ Periscope's *USNI Military Database*, Taiwan's Armed Forces Structure, 1 April 1996.

⁹⁴ *Jane's Sentinel*, paragraph 1.15.5.

⁹⁵ Chong-Pin Lin, "The Military Balance in the Taiwan Straits," *The China Quarterly*, no. 146 (June 1996), 594.

This indicates the need for the US military to provide “western” training levels and intelligence to its Taiwanese counterparts. The continued emphasis on training will allow Taiwan to be better prepared than China if the time comes for a shooting match. Better training and equipment can compensate for being outnumbered, but a Taiwanese integrated air defense system (SAMs and air defense aircraft) will significantly increase the PLAAF problems of gaining air superiority, a necessary condition for a Chinese blockade or invasion.

During the next twenty years, if Chinese modernization continues at its current pace, Taiwan’s forces will become overwhelmed. As this transition occurs, the US must prepare to defend Taiwan against PRC invasion.

The USAF specifically needs to ensure that there are adequate basing rights for possible conflicts in the Taiwan Strait. As noted in Table 3, distances between islands in the Pacific are large when compared to unrefueled aircraft ranges. Worse, the ranges do not always favor coalition air power. At times, the enemy is closer to our potential bases than we are to Taiwan, making self-defense a major issue.

Table 3. Pacific Ranges.⁹⁶

Base/ Country	Okinawa (Japan)	Guam (US)	Misawa (Japan)	South Korea	DaNang (Vietnam)
Range to Taiwan	410 NM	1375 NM	1100 NM	750 NM	750 NM
Range to China	370 NM	1475 NM	600 NM	320 NM	325 NM

The nature of the conflict is of utmost importance to the US ability to use these bases. Other than Guam (a US possession), Japanese, South Korean and Philippine basing rights may

⁹⁶ Distances are from specific air bases, when specified, to the center of Taiwan. For South Korea, the distance is from the center of South Korea to the center of Taiwan.

not be authorized for use in a conflict.⁹⁷ Many of these countries do not weigh the risk of Taiwan coming under Chinese control as worth the risk of Chinese attacks against their soil. These countries quietly prefer to see Taiwan succeed, but are not willing to risk crossing a major power, let alone a nuclear one, in the region.

The ranges listed in Table 3 and the requirements to use these bases will force US land based aircraft to fly long distances to Taiwan to accomplish their missions, and then return to the base they took off from. Bases on Taiwan and the surrounding islands, such as Peng Hu, with established airfields offer the opportunity to place a few squadrons much closer to the fight, possibly as much as two wings of fighter aircraft.

During a conflict near the strait, Taiwan's airspace will be bustling with activity. Although the Taiwanese airfields are busy, there is room for some US aircraft to be deployed there, once hostilities start. Taiwan has twenty airfields with runways that are 8,000 feet or longer, which is considered the minimum length for fighter operations. Of those, only eight are longer than 10,000 feet.⁹⁸

USAF fighters and some other aircraft (C-17s, C-130s, and KC-135Rs) would be able to operate from all of these runways, yet they might be vulnerable to Chinese attacks by ballistic missiles and SOF. Large aircraft operating at or near maximum gross weight, like the C-5 and KC-10, will require the use of the longer runways. Deploying to these bases during combat operations would be very risky, since the aircraft and personnel would be most vulnerable during the arrival phase, especially if air superiority is being contested.

The obvious advantage that these air bases would have is the short range to the conflict and the reduced response time needed to react to rapidly changing events. The drawbacks of being

⁹⁷ Kreisberg, "Asian Responses to Pressures on Taiwan," in Chang and Lasater, 93-95.

⁹⁸ CIA, 554.

so close are the limited time available to defend from attacks, the larger number of Chinese assets that can make those attacks, and the likelihood of pro-Chinese sympathizers among the population. Godwin argues that SOF will play a primary role against Taiwan, and that airfields will be a part of their target, along with the morale of the population.⁹⁹

Carrier-based aviation will also play an active role in any confrontation in the Pacific. Due to the scope of the operation, this scenario would tie up nearly all of the US carrier battle groups (CVBGs) that are active in the Pacific. Depending on which ships are at sea and which are in port for training and maintenance, US forces could plan on three, and possibly four CVBGs. During the 1995 Chinese missile firings, the US sent two CVBGs into the waters around Taiwan as a show of support. Increasing the number to at least three allows for 24 hour operations from carrier-based naval aviation. In addition, the CVBG package provides ASW and missile defense systems that could protect the battle group and depending on its location, might be able to defend portions of Taiwan from missile attacks. A big advantage of carrier air power is that it can be prepositioned in the area without directly affecting the US “one China” policy.

Each US aircraft carrier would bring about 70 aircraft to the fight. However, similar to China’s reduced sortie operations, carrier air employs about 70 percent “over the beach” sorties to support the operation. Each carrier air wing will provide about 50 combat sorties per day, over a twelve-hour period and would need to be withdrawn for replenishment after about a week of combat. Three carriers would then total 100 sorties per day, rotating for replenishment one at a time.

The primary mission for Taiwan would be assurance of air superiority. Once this was achieved, any Chinese attempt at an amphibious invasion would be vulnerable to destruction by Taiwan’s capabilities mentioned previously. China’s ability to mount a serious invasion attempt

⁹⁹ Godwin, “Use of Military Force Against Taiwan,” in Chang and Lasater, 25-26.

would require significant use of merchant vessels. These vessels would be extremely vulnerable to all military attacks. Taiwan's ability to repel the military portion of an amphibious assault begins with air power and the TN surface fleet attacking the shipping at longer ranges, followed by shore defense repelling any ships that got through. The shore defenses include a mix of surface-to-surface missiles and large caliber guns enveloping probable landing sites.

Summing up the air battle for the near-term, Taiwan can fly 300 sorties per day for air defense purposes. This sortie total does not include any US support, but does not provide the TAF with an offensive capability against Chinese targets, forcing Taiwan into a defensive role.

China can average some 250 fighter sorties per day (200 J-5, J-6, J-7 and J-8 sorties plus 48 Su-27 sorties) and 210 light or medium bomber sorties. The PLAAF theoretically could mass significantly more aircraft (near 800) for a single strike, but lacks the ability to command and control such a large force. The first few days China may fly slightly more than 250 sorties, but the numbers would taper off for a sustained conflict.

Taiwan has the advantage, because of better equipment and training, even with a slightly smaller number of sorties. This advantage is increased when the Taiwanese SAM systems are factored into the conflict.

Future Situation

As China continues to modernize, future Chinese forces will become harder to defeat with Taiwanese forces alone. As China continues to procure (either purchase or produce) first-rate military assets, Taiwan will not be able to employ a majority of technologically better assets to win a conflict.

As the number of Chinese first-rate fighter aircraft approaches 500, matching forecasted Taiwanese assets,¹⁰⁰ then Taiwan will need assistance to maintain air superiority. The US can provide that assistance in the form of air superiority aircraft, airborne warning and control aircraft and additional theater missile defense aircraft, all of which may be considered defensive assets, fulfilling the requirements of the TRA. These and other assets may even be sold to Taiwan, bolstering their own capabilities.

While continuing the current trend of US weapons sales to Taiwan for defensive purposes, there will be a problem associated with the Taiwan Relations Act. As China modernizes its military, the US will need to supply Taiwan with equipment that meets the defensive needs of Taiwan. The problem is that most of this might also be used in an offensive manner against China, as well as for defensive purposes.

Taiwan may provide assurances that the future equipment will be used for defensive purposes only, but China's perception will be the key. In a worst case scenario, China may perceive that the front line equipment needed to defend Taiwan would be used in an offensive manner against China, encouraging steps in Chinese policy to neutralize the threat in a security dilemma.¹⁰¹

Yet defending Taiwan twenty years from now against an increased Chinese threat may require offensive attacks by US-Taiwanese assets against Chinese military targets. These targets would include PLAAF bases and equipment that are waging the battle for air superiority and PLAN ports and ships that would conduct the invasion. This is one major change from today's

¹⁰⁰ *Jane's Sentinel*, paragraph 8.12.11.

¹⁰¹ Robert Jervis, *Perception and Misperception in International Politics* (Princeton University Press, 1976), 66. The Security Dilemma occurs when actions that you take to become secure, may over the long run make you less secure. In this scenario, Taiwan's procurement of better defensive measures may force China's hand to increase their focus upon Taiwan and procure even more and better military equipment and training to debilitate the Taiwan threat. For more on this phenomena, see Jervis in Chapter 3.

situation, where Taiwan can defend from an attack by gaining air superiority without needing to attack mainland targets.

Twenty years from now, China may be able to employ 600 fighters and around 200 light or medium bombers against Taiwan, plus the missile threat (from Table 1, Chapter 2). This is three times China's capability today. As Taiwan's modernization tops out around 340 modern aircraft,¹⁰² China will be able to overwhelm the Taiwanese air defenses. The United States will have to supplement Taiwan's air defenses to ensure that US-Taiwanese air superiority is maintained.

Chinese modernization that improves the PLAN and significantly increases naval amphibious capability will produce other problems as well. Taiwan can currently defend against China's present amphibious forces, but that may not be true in the future. Just as China may develop the ability to overwhelm Taiwanese air defense assets, they may develop the ability to overwhelm their amphibious defenses.

The air battle in 2018 has Taiwan flying about 340 high-tech fighter sorties (F-16s , Mirage 2000s, and the Ching-kuo fighter) against China's forecasted 500+ high-tech fighter sorties (Su-27s and F-10s) plus 190 light or medium bomber sorties. Taiwan will be at a significant disadvantage, since there is little forecasted technology gap to capitalize on. Without external support, Taiwan probably will not be able to maintain air superiority over Taiwan, let alone over the Strait.

The United States would have to provide sufficient aircraft to give Taiwan the advantage, by adding sorties to Taiwan's air defenses and provide the means (i.e., SEAD, strike, and EW) for offensive counter air (OCA) operations on mainland China. The OCA attacks against targets

¹⁰² *Jane's Sentinel*, paragraph 8.12.11.

like the Nanjing airfields and the Chinese SAM systems defending the Strait would provide Taiwan the assurance of air superiority.

Implications for USAF

US and Taiwanese airpower must continue to be able to gain air superiority over Taiwan and the Taiwan Strait in the near future. To do so, there are several things that US airpower must accomplish to ensure that the mission is accomplished. Once that air superiority is gained, US-ROC must have sufficient forces to maintain that air superiority and to prosecute an amphibious defense at the same time.

Implication 1: *US airpower must be able to operate and gain air superiority over the Taiwan Strait, within the threat rings of current and next generation SAMs.* The ability to operate within the envelopes of SA-10s and 12s that may be deployed in mainland China, yet still have the range to engage targets over or near Taiwan is a capability that is not yet available.

The USAF has a relatively small number of stealth aircraft that can employ ordnance against targets within these threat rings, and has standoff precision ordnance that many other assets can employ. Yet this capability does not yet meet the needs of this requirement. The stealthy aircraft that can be employed within the threat rings, can only do so at night, avoiding daylight optical systems. The F-22 air dominance fighter promises to be the aircraft that can operate day or night by significantly reducing these threat rings, but this ability has not been proven yet. The large-scale production of the F-22 is also still in question.

Production of the Joint Strike Fighter (JSF) and employment of other stealthy assets, like the B-2, may also improve the US ability to operate within the threat rings. Continued emphasis on SEAD and munitions that allow non-stealthy assets to employ against the threat, such as the Joint

Stand-Off Weapon (JSOW) will improve both the US and Taiwanese ability to gain air superiority over the Strait.

Future enemy systems may also be able to defend against the standoff precision munitions, reducing their effectiveness. This may then force non-stealthy assets into higher threat missions, increasing US-Taiwanese anticipated attrition rates. Today's non-stealthy aircraft may be relegated to defensive counter air missions over Taiwan proper, just skirting the outer edges of the Chinese SAMs, if SEAD assets and stand-off weapons are countered.

Next generation enemy aircraft and defense systems may also be more effective against current stealth technology, further reducing US advantages. The USAF must continue to research and develop aircraft that are stealthy in spectra outside of the radar bandwidth, to include the IR spectrum, and be capable of employment characteristics that can defeat a wide spectrum of threats.

Gaining air superiority over Taiwan can be achieved twenty years from now by employing US and Taiwanese assets in Defensive Counter Air (DCA) roles. There will be significant reliance on early warning and control and electronic warfare assets to give the US-Taiwanese forces the advantage to ensure success. Gaining air superiority over the Strait will require Offensive Counter Air (OCA) missions to reduce China's ability to mass aircraft over the Strait.

These OCA missions will target Chinese air defenses that will attempt to control the airspace over the Strait, including the SAMs, and the airfields that are close enough to the engagement zone to allow the shorter range fighters to fight. Targeting these threats on the ground requires more than just operating within the threat rings though.

Implication 2: *US airpower must be able to employ ordnance that is highly effective in both air-to-air and air-to-surface roles.* The next generation of combat aircraft are being designed to

employ ordnance that works well on today's aircraft. As the quantity of aircraft decreases, it is important to make every sortie count, by using accurate and effective munitions.¹⁰³ Since US-ROC aircraft will be operating at a large numerical disadvantage, they must make the most of each sortie.

An example of the "munitions buyout" problem is foreseen on the F-22. The main air-to-air weapon on the F-22 is the Advanced Medium Range Air-to-Air Missile (AMRAAM), which is used on today's F-15s and F-16s. The Su-27 is capable of employing the AA-10C Alamo long-range missile which has a range advantage against the AMRAAM. The F-22 has a stealth advantage providing a first shot opportunity, yet this is valid only when the Su-27 is targeted against the F-22. The Su-27 pilot could employ AA-10Cs against non-stealthy aircraft flying with F-22s prior to the F-22 being able to target the Su-27. USAF procurement of a Long Range Air-to-Air Missile (LRAAM) would help solve this problem.

There are similar shortfalls in planned air-to-ground munitions. One example is munitions that rely on the Global Positioning System (GPS) for accurate guidance. GPS is a relatively weak radio signal that can be jammed (soft kill) or lost through satellite destruction (hard kill). The accuracy of these weapons aside, the USAF must strive to attain multiple kills per pass. Aircraft like the B-2, employing guided several weapons per pass may make the huge investment for those aircraft pay off. This capability would greatly reduce the numerical advantage of the PLA.

The OCA strike missions against China will require a mix of bomber and fighter attack sorties. Some of the targets will require the precision of laser guided bombs, delivered from platforms like the F-117 and F-15E. Other targets may not need such exceptional accuracy, allowing accurate (rather than precise) aircraft, like the B-1 to employ the munitions.

¹⁰³ Shlapak, "Chinese Defense Modernization and the USAF," briefing notes, 28.

Implication 3: *The USAF must prepare to fight a space-faring nation.* As China modernizes its air and naval forces, increasing space capabilities may be China's greatest asset. Many scholars debate whether China will become a great continental power or a maritime power,¹⁰⁴ yet both sides may miss the mark. China has a domestic satellite system with 55 ground stations in place and has the ability to employ space assets to gather information on enemy forces and may begin developing capabilities to reduce our effectiveness in space.¹⁰⁵

This has several limited yet significant implications on the USAF. The US ability to Command and Control (C2) and to communicate with "shooters" will be severely limited if an adversary is able to disrupt our on-orbit platforms. Another shortfall that we face is in the weapons employment arena. Many of our current and future weapon systems rely on GPS to provide accurate navigational data to guidance systems.

There is a need for the USAF to procure air-to-air and air-to-ground weapon systems that are not reliant solely on GPS. Many of the weapons being procured now rely on a direct GPS signal, or on accurate information passed from the aircraft, which is derived from GPS. Placing all of our capabilities in one basket is potentially dangerous.

Implication 4: *The USAF must be able to deter conflict escalation during direct confrontation with a nuclear power.* During the Cold War, the US was able to limit direct confrontations with the Soviet Union by clearly stating its vital national interests. The ambiguity of our commitment in the TRA may cause confusion about a US response. This scenario will test the limits of diplomacy, military might and the ability to escalate the conflict for both sides.

One way to deter conflict escalation is to have a proven ability to defend Taiwan, without China sensing a closing window of opportunity. Currently the window is closed, since Taiwan

¹⁰⁴ Wortzel, 157-175.

¹⁰⁵ CIA, 104.

can adequately defend against an invasion with the current force structure of both sides. As China modernizes, though, the USAF must be careful not to allow a period where China perceives that a US-ROC coalition cannot defend Taiwan.

Combined exercises with Taiwanese forces would show a US level of commitment that may deter Chinese aggression, but also might be politically costly. This would also work to the benefit of the Taiwanese military, providing increased military to military contacts, additional training and confidence that Taiwan has the ability to stay on the defensive side of a possible conflict and still “win,” or at least not lose.

Implication 5: *The USAF must be able to counter and operate under the Chinese ballistic missile threat that currently extends to the western portions of North America.* All Pacific operating locations previously discussed fall within employment ranges of Chinese missile systems. Even if nuclear escalation is deterred, Chinese doctrine, fashioned after the old Soviet doctrine, employs conventionally armed ballistic missiles to help gain their objectives. One example of China’s willingness to employ conventional missiles was the missile firings just north of Taiwan in 1995.

China possesses many types of surface-to-surface missiles and is even exporting some of the older missile systems.¹⁰⁶ Although much information about them is classified or sketchy, China is spending heavily in ballistic missile research and development. The CSS-6 and CSS-7 tactical ballistic missile systems already in place may be further supplemented by DF-25, 31, 41 and 61 missile systems currently being developed.¹⁰⁷

US forces will have to be able to survive these missile barrages, through deterrence, enemy missile destruction, or through survivable means on the ground. Parking in Taiwan’s

¹⁰⁶ John Caldwell and Alexander Lennon, “China’s Nuclear Modernization Program,” *Strategic Review*, Fall 1995, 34.

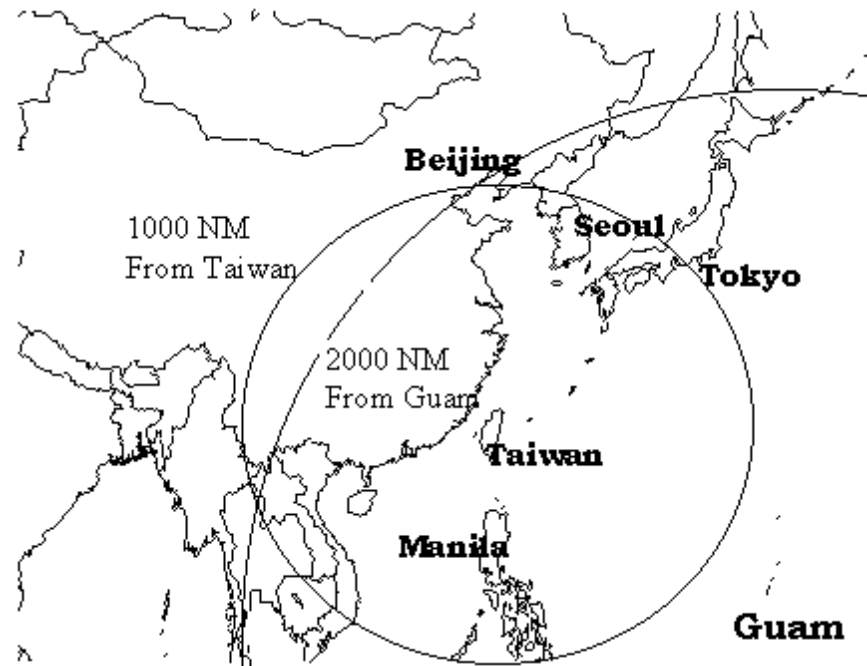
underground hangar, or in hardened aircraft bunkers capable of withstanding conventional missile impacts may provide this opportunity to survive. Although the Chinese missiles are not very accurate, US-Taiwan employment will be disrupted during missile engagements. The accuracy of the missiles will continue to improve as China procures “dual use” technologies from many sources. Fielding a US theater or global ballistic missile system will go a long way to solving this problem. China is not likely to use nuclear, biological, or nuclear weapons against Taiwan, since it is trying to bring Taiwan into the fold. Use against US targets, like Guam, is also doubtful, due to fear of US WMD retaliation.

Space assets may be the only systems capable of providing adequate missile defense across a theater. China’s array of missiles and aircraft will complicate air defense problems for the theater. The US must develop an integrated, layered air defense that can be projected to locations such as Taiwan. This defense will probably consist of a combination of aircraft (land and sea based), SAMs (land and sea based) and probably an on-orbit system capable of rapid recognition, targeting and destruction of theater and intercontinental ballistic missiles.

Implication 6: *The USAF must be able to project air superiority from austere airfields that are 1000-1500 NM away from the desired engagement zone.* In this scenario, the US is not guaranteed the use of any base outside of Taiwan that does not belong to the US (such as Andersen AB, Guam). US allies may not see the Chinese as a long-term threat, similar to the now defunct Soviet Union. This open door may provide current allies the opportunity to sidle from what we consider to be their responsibilities.

¹⁰⁷ *Jane’s Sentinel*, paragraph 1.10.4.

Countries in ASEAN and Japan either will not codify their willingness to allow the US military to operate from their homelands, or may wish to wait for the *fait accompli* before making their decision.¹⁰⁸



Map 1. Ranges From Guam and Taiwan.¹⁰⁹

Diplomatic relationships at the initiation of hostilities and the nature of how the hostilities began may offer increased access to basing rights. Russia and the US Aleutian Islands (2500 NM to Beijing and even longer to Taiwan) may be the next best source for offensive forces.

Diplomats will address this problem, yet the USAF must prepare to meet US commitments regardless of the answer. The sword is a double-edged one. If the US cannot project air superiority over the vast expanse of the Pacific, then these countries will likely perceive that China has the stronger hand in conflict. This perception may force US-Taiwan allies to avoid

¹⁰⁸ Kreisberg, "Asian Responses to Pressures on Taiwan," in Chang and Lasater, 93. He goes on to say that the Philippines would not be available for use for naval or airfields. South Korea and Singapore would also fall into the same decision process. Bases that may be available for use include those on the Australian continent and US owned airfields (Guam, Hawaii, and Alaska.)

entering or supporting a shooting conflict. If the US is able to project the air superiority and the allies perceive that we will win, then the basing is more likely to be available, making the problem somewhat easier.

The extended range that aircraft may need to deploy creates several problems for the future USAF force structure. The aircraft that are capable of gaining air superiority must be able to fly the extended range, but then must also be able to loiter in the operational area. Aerial refueling will be an enabler for this mission, but the aircraft must be able to be much more self-sufficient than they are now. Aircraft needed for this role need to achieve range performance that approximates a combat radius of 1200-1500 NM, with an on-station loiter time near four hours on a single aerial refueling. The single aerial refueling will significantly reduce the reliance on and burden to the tanker fleet.

Current aircraft like the F-15 and F-16 require four aerial refuelings each to accomplish this mission. A flight of four F-15s would require 216,000 pounds of fuel and a flight of four F-16s would require 120,000 pounds.¹¹⁰ These large fuel offloads would require three KC-135Rs for the F-15 flight and two for the F-16 flight using a 70,000-pound average offload for the KC-135. Although capable of offloading more fuel, the tankers will also be operating at extended ranges.

It is reasonable to assume that about half of the USAF tanker fleet (around 200 aircraft) would be available for use in this scenario. Averaging one sortie a day, each tanker would support missions from aircraft based in Guam, US based bombers and airlifters coming into theater, and to refuel High Value Assets (HVA), increasing their endurance to ensure 24 hour

¹⁰⁹ David Shlapak, "China Defense Modernization and the USAF," briefing notes. 1000 and 2000 mile range rings added.

¹¹⁰ Each F-16 would need to onload about 10,000 pounds of fuel to fly 1,500 NM and be full on arrival, and another 20,000 pounds during the four hour on station to depart full for the return trip, for a total onload of 30,000 pounds per aircraft. The F-15 fuel requirements are almost double that of the F-16, which approaches a ratio of one tanker for each fighter.

coverage. Developing a fighter aircraft with aircraft capabilities similar to the F-22 or JSF and having an endurance of the Su-27 would significantly reduce the burden placed on the aerial refueling fleet.

The long ranges required for such missions compound the problem of aircraft utilization rates. Aircraft accomplishing this lengthy mission will be available for at most a single sortie a day. Increased speed to and from the combat area will reduce the flight time. Reduced utilization rates require more aircraft than needed to accomplish a similar shorter-range mission. The F-22 super-cruise feature will reduce flight time to and from the combat area, reducing pilot fatigue and increasing sortie availability.

US aircraft would need to fly the equivalent of 350+ air defense sorties per day, and then add to that the amount for the offensive attacks. These fighter aircraft would fly out of Andersen AB, and two wings (72 aircraft each) could probably deploy to Taiwan once air superiority is assured. F-15, F-16 and F-18 aircraft (with sub-sonic cruise) will average slightly more than one half of a sortie per day because of the ranges involved. An F-15 or F-16 flying from Andersen AB would fly more than ten hours for a four hour CAP mission over Taiwan. The F-22 with super-cruise would fly slightly over seven hours for the same four hour CAP mission. The reduced flight time may allow for slightly higher sortie rates, but the planned purchase of 339 F-22s limit its availability for this scenario. The F-22 fleet size may allow for two wings (72 aircraft each) to Guam or bases in Taiwan.

The major problem for the long-range missions is that these sorties must be preplanned and will have little surge capability for crisis options. To ensure that the United States has enough fighter aircraft available for the operation, the USAF must deploy nearly 300 fighter aircraft, in addition to the three carriers already discussed.

Summary

The United States is committed to defending the ROC, as stated in the Taiwan Relations Act of 1979. Although the wording of the act is ambiguous, the USAF must be prepared to fight alongside the USN in defense of Taiwan. While the acute distances of the Pacific increase the time required for the CVBGs to transit in and out of the fighting area, the USAF will have to deal with these distances every sortie. The shallow and confined waters of the Strait, combined with China's land based threats to surface ships, will force the CVBGs to operate from the east side of Taiwan, increasing the range for naval aircraft also.

Unlike the 1991 Desert Storm conflict, where many airfields and much POL was available for use, the defense of Taiwan will be fought from islands that may not offer such resources. These islands will need routine resupply of all combat material. Although the US has current basing rights throughout the Pacific for operations, due to restrictions, many of these bases may not be available during a shooting conflict with China.

Taiwan and US possessions are the only bases that can be counted on for use. During a shooting conflict against the PRC, Taiwan's airbases will be attacked. These attacks may come in the form of ballistic missiles, cruise and other air-to-surface missiles, SOF attacks, and direct aerial attack by bombers and fighter aircraft. It is unlikely that the US will position combat assets in Taiwan prior to the start of hostilities because of our "one China" policy.

Taiwan can currently defend itself from a PRC invasion, but as Chinese modernization continues, Taiwan's defense will become overwhelmed in the event of an attack. The scales will be tipped in China's favor when Su-27 (and equivalent aircraft) procurement exceed Taiwan's

ability to match their numbers one-for-one. Taiwan plans to procurement 340 modern aircraft,¹¹¹ which is a reasonable number to use to estimate the changing of the balance to China's favor.

The PRC will most likely always outnumber Taiwan's forces, but better training and experience with better weapons will continue to weigh heavily in Taiwan's favor.¹¹² This is what counts for the current Taiwanese advantage now and in the near future. As the balance shifts, assuming a continued PRC modernization program, Taiwan will need outside support to guarantee a successful defense.

In the next twenty years, the Chinese modernization will require the US to prepare to support Taiwan against a Chinese invasion. With basing rights in question and the US "one China" policy, the USAF must prepare to operate from Guam prior to, during, and after the initiation of hostilities. As the conflict develops into a shooting war, then some of the US aircraft can expect to be authorized to operate from some airfields in Taiwan.

Operations from Guam will place a heavy burden on the USAF tanker fleet, with more than one tanker supporting every flight of four aircraft operating from Guam. As the US is able to place combat assets on Taiwan, then the aerial refueling requirements will be reduced, although not eliminated. Some fighter aircraft will continue to operate from Guam and much of the high value aircraft (AWACS, ELINT, J-STARS) will operate from extended range, minimizing their exposure to attack. Aerial refueling will be required to ensure time-on-stations requirements are met, to ensure 24 hour coverage by these assets.

The increased ranges significantly reduce the utilization rates of the combat aircraft. To ensure maximum efficiency, the USAF must procure effective and longer range weapons, both

¹¹¹ *Jane's Sentinel*, paragraph 8.12.11.

¹¹² *Jane's Sentinel*, paragraph 8.12.2.

air-to-air and air-to-surface, to make up for the reduced number of sorties per aircraft and the numerical disadvantage.

While this conflict is going on, the US must be able to operate under the ballistic missile threat of China, which has a substantial on orbit capability to monitor and gather intelligence on US forces. China is a nuclear capable country, with a limited ability to strike targets in the continental US. While fulfilling the US commitment to defend Taiwan, we must also understand the nature of the conflict and China's ability to escalate to a nuclear war.

These implications are developed specifically from the Taiwan - China invasion scenario, but apply in a much broader sense. As the US military becomes smaller, we have a reduced overseas presence, which also reduces our ability to employ overseas. The ability to accomplish the Taiwanese mission will also improve USAF capabilities to deal with the continuing trend of basing our aircraft in the CONUS.

Chapter 6

Conclusion

This research has examined the defense of Taiwan, not with respect to its political desirability, but with respect to military feasibility. Defending a small island country that is half way across the globe from the US and within a stone's throw of an emerging world power is a daunting task.

Although the task of defending Taiwan *appears* to be an unlikely task for the future, this scenario may occur. The US has indicated that we will defend Taiwan through the Taiwan Relations Act of 1979; however, the USAF may not be ready to defend Taiwan, should it be called upon to do so.

As China continues to modernize militarily and slowly drags its economy towards capitalism, there may be a resurgence of Chinese expansionism. The sheer size of China, in both population and geography, tends to make China a powerful player in the region. China has been an emerging power for some time and the trend does not seem likely to reverse itself.

China shows a patient ability to slowly modernize, deterring the Soviet Union and other would be nuclear aggressors by developing a capable nuclear arsenal. China's patience is important since it could not now invade Taiwan, but may be able to do so in the near future. China is beginning to settle border disputes with Russia and is attempting to modernize its land-

oriented military that in the past has been designed for massive conventional conflict.¹¹³ “The PRC today wants to appear more powerful and capable than it actually is,” giving China the ability to attain other items of national interests on the world market.¹¹⁴ Taken together, these facts may be the warning signs of a conflict on the horizon.

PRC modernization allows China to weigh in more heavily against the ASEAN states and begin the first steps towards hegemony in the South East Asia region. One of the most likely first steps is to consolidate power locally. This leads directly to Taiwan and the PRC’s One China policy.

Asia’s economy in general and China in particular have had spectacular growth in the 1990s. China’s ability to keep its economy growing while modernizing the PLA will require restructuring and internal efficiency improvements.¹¹⁵ This trend continues to show incremental changes for the PLA. Although not yet a peer competitor to the US as a world superpower, China’s improvements will soon exceed Taiwan’s ability to defend itself. In the near future, as Taiwan needs more and more support to mount a credible deterrent or defense, the US will be able to intervene in a successful manner.

There are several implications that the USAF must address as China’s ability to invade Taiwan grows. First, US airpower must be able to operate and gain air superiority over the Taiwan Strait, within the threat rings of current and next generation SAMs. As China procures longer range high-tech SAMs that can be based in mainland China, yet still project a threat over Taiwan, the USAF will have to be able to operate within these threats to gain air superiority and conduct ground attack missions.

¹¹³ “China, Russia resolve nearly all land disputes,” *Jane’s Defense Weekly*, 19 November 1997, 13.

¹¹⁴ Ralph A. Cossa, “The PRC’s National Security Objectives in the Post-Cold war Era and the Role of the PLA,” *Issues and Studies*, September 1994, 15.

¹¹⁵ International Monetary Fund, October 1997, World Economic Outlook, at <http://www.imf.org/pubs/weo1097/>, 2.

Second, US airpower must be able to employ ordnance that is highly effective in both air-to-air and air-to surface roles. US-ROC airpower will be significantly outnumbered, so the effects of each sortie must be maximized to counter the PRC's numerical advantage.

Third, the USAF must prepare to fight a space-faring nation. The PRC has an active, growing space program capable enough to monitor the strategic movements of US air power. Political or technological constraints may restrict US employment options that could limit this capability, requiring the USAF to operate while being watched by the enemy.

Fourth, the USAF must be able to deter conflict escalation during direct confrontation with a nuclear power. The mission must be accomplished in a manner that does not threaten the existence of China, yet provide a credible presence showing US sincerity.

Fifth, the USAF must be able to counter and operate under the Chinese ballistic missile threat that currently extends to the western portions of North America. While deterring strategic escalation, US-Taiwan forces must be able to withstand Chinese conventional ballistic missile launches aimed at disrupting operations. This is China's primary offensive weapon currently, yet this is one of the weakest areas for the United States.

Sixth, and perhaps most significantly, the USAF must be able to project air superiority from austere airfields that are 1000-1500 NM away from the desired engagement zone. The long ranges of the Pacific theater, the aging aerial refueling force and the reluctance of allies to guarantee US basing rights set this scenario apart from others.

The US supports a one China policy. Yet since 1979, we have promised Taiwan our defense of the island, to ensure a peaceful settlement. Taiwan has made dramatic steps in improving human rights and created a democratic political system, without thus far having provoked China

into an armed conflict. As Taiwanese citizens enjoy de facto independence, they may push for international recognition as an independent country.

A people's right to self-determination is one of the inalienable rights that the US has long stood for. Taiwan's independence would go against the current US policy of recognizing a "one China," yet we have pledged our defense forces through the Taiwan Relations Act. The 103rd Congress passed legislation that would "support Taiwan's entry into the UN and other international organizations, allow high-level Taiwan officials to visit the US and to promote arms sales to Taiwan."¹¹⁶ The 104th Congress appears to be headed in the same direction.

The USAF does not get to pick the fights we enter and sometimes we do not get to determine how to fight them. But this is one fight that we can prepare for, and that preparation will lead the Air Force down the road of force projection. The US is the single greatest world power; what we choose to plan for now will determine the structure of the world that follows this time period.

Although we cannot be sure of the particulars over Taiwan and China's modernization, we may face similar situations. We need long-range strike aircraft that are air-to-air capable. These aircraft must be supported with efficient and effective weapons. As the superpower, our national objectives may not assure coalition basing or cooperation, so we must be prepared to fight alone or with few supporting allies.

¹¹⁶ Robert G. Setter, "Taiwan: Recent Developments and US Policy Choices," Foreign Affairs and National Defense Division, Congressional Research Service: Issue Brief, IB94006, 8 November 1995.

Appendix A

Excerpts from the Taiwan Relations Act of 1979

Public Law 96-8 of 10 April 1979

Short Title

SECTION 1. This Act may be cited as the “Taiwan Relations Act.” (TRA)

Findings And Declaration Of Policy

SECTION 2. (a) The President having terminated governmental relations between the United States and the governing authorities on Taiwan recognized by the US as the Republic of China prior to January 1, 1979, the Congress finds that the enactment of this Act is necessary-

(1) to help maintain peace, security, and stability in the Western Pacific, and

(2) to promote the foreign policy of the US by authorizing the continuation of commercial, cultural, and other relations between the people of the United States and the people of Taiwan.

(b) It is the policy of the United States –

(1) to preserve and promote extensive, close, and friendly commercial, cultural, and other relations between the people of the US and the people on Taiwan, as well as the people of the China mainland and all other peoples of the Western Pacific area;

(2) to declare that peace and stability in the area are in the political, security, and economic interests of the US, and are matters of international concern’

(3) to make clear that the US decision to establish diplomatic relations with the People’s Republic of China rests upon the expectation that the future of Taiwan will be determined by peaceful means’

(4) to consider any effort to determine the future of Taiwan by other than peaceful means, including by boycotts or embargoes, a threat to the peace and security of the Western Pacific area and of grave concern to the US;

(5) to provide Taiwan with arms of a defensive character; and

(6) to maintain the capacity of the US to resist any resort to force or other forms of coercion that would jeopardize the security, or the social or economic system, of the people of Taiwan.

(c) Nothing contained in this Act shall contravene the interest of the United States in human rights, especially with respect to the human rights of all the approximately eighteen million inhabitants of Taiwan. The preservation and enhancement of the human rights of all people on Taiwan are hereby reaffirmed as objectives of the United States.¹¹⁷

¹¹⁷ Provided online by Indiana University faculty at – <http://www.easc@indiana.edu>, August 1997.

Bibliography

- Ackerman, Julia A., and Michael Collins Dunn. "Chinese Airpower Revs Up," *Air Force Magazine*, July 1993, pp. 56-59.
- Allen, Kenneth W., Glenn Krumel, and Johnathon D. Pollack. *China's Air Force Enters the 21st Century*. Santa Monica, CA: Rand, 1995.
- Bachman, David. "Domestic Sources of Chinese Foreign Policy." In *China and the World: Chinese Foreign Relations in the Post-Cold War Era*. Edited by Samuel Kim, Boulder, CO: Westview Press, 1994.
- Ball, Desmond. "Signals Intelligence in China." *Jane's Intelligence Review*, vol. 7, no. 8 (August 1995), pp. 365-370.
- Caldwell, John and Alexander Lennon. "China's Nuclear Modernization Program." *Strategic Review*, Fall 1995, pp. 27-37.
- Central Intelligence Agency. *The World Factbook – 1997-98*. Washington: Brassey's Edition, 1997.
- Chang, Parris H., and Martin L. Lasater. *If China Crosses the Taiwan Strait – The International Response*. New York: University Press of America, 1993.
- "China, Russia resolve nearly all land disputes." *Jane's Defence Weekly*, 19 November 1997, pp. 13.
- Chu, Shulong. "China and Strategy: The PRC Girds for Limited, High-Tech War." *Orbis*, Spring 1994, pp. 177-191.
- Cossa, Ralph A. "The PRC's National Security Objectives in the Post-Cold War Era and the Role of the PLA." *Issues and Studies*, vol. 30, no. 9, September 1994, pp. 1-28.
- "Country Briefing: China — Major Modernisation Sees Slimmer Giant." *Jane's Defence Weekly*, 10 December 1997, pp. 24-28.
- "Country Briefing: China — Out-Dated Logistics System Overhauled." *Jane's Defence Weekly*, 10 December 1997, pp. 29-32.
- "Country Briefing: China — Russian imports step in to fill the arms gap." *Jane's Defence Weekly*, 10 December 1997, pp. 27-28.
- Feigenbaum, Evan A. *Change in Taiwan and Potential Adversity in the Strait*. Santa Monica, CA: Rand, 1995.
- Gansler, Jacques S. *Defense Conversion*. Cambridge, MA: MIT Press, 1996.
- Godwin, Paul H. B. "The Chinese Communist Armed Forces." Report. Maxwell AFB, AL: AU Press, Center for Aerospace Doctrine, Research and Education, June 1988.
- Hellenbeck, Ralph A., et al. "China's Nuclear Weapon's Modernization Program, Nuclear Warfare Doctrine and Strategy, and Prospects for Strategic Arms Control." Paper for a workshop sponsored by the US Arms Control and Disarmament Agency, 1995.
- International Monetary Fund. *World Economic Outlook*. Staff survey, October 1997. Available at <http://www.imf.org/pubs/weo1097/weo0197c.htm>.
- Jane's All The World's Aircraft*. New York: Jane's Information Group, 1997-98.

- Jane's All The World's Aircraft*. New York: Jane's Information Group, 1981-82.
- Jane's Armor and Artillery*. New York: Jane's Information Group, 1997-98.
- Jane's Sentinel*: "China." New York: Jane's Information Group 1997.
- Jane's Sentinel*: "Taiwan." New York: Jane's Information Group, 1997.
- Jane's Strategic Weapons Systems*. New York: Jane's Information Group, Jan 97, Issue 23.
- Jervis, Robert. *Perception and Misperception in International Politics*. Princeton University Press, 1976.
- Khalizad, Zalmay M., and David A. Ochmanek. *Strategic Appraisal 1997: Strategy and Defense Planning for the 21st Century*. Santa Monica, CA: Rand, 1997.
- Lin, Chong-Pin. "The Military Balance in the Taiwan Straits." *The China Quarterly*, no. 146 (June 1996), pp. 577-595.
- Mulvenon, James C. *Professionalization of the Senior Chinese Officer Corps*. Santa Monica, CA: Rand, 1997.
- Ng Ka Po. "China Defence Budgeting: Structure and Dynamics." In *China Review 1995*. Edited by Chi-Kin Lo, Suzanne Pepper, and Kai-yuen Tsui. Hong Kong: The Chinese University Press, 1995, pp. 9.1-9.36.
- Periscope's USNI Military Database. "Taiwan's Armed Forces Structure." 1 April 1996.
- Porteous, Holly. "China's View of Strategic Weapons." *Jane's Intelligence Review*, vol. 8, no. 3, March 1996, pp. 134-137.
- Raytheon. <http://www.raytheon.com/PatriotResponse.html>. 25 Mar 1998.
- Sagan, Scott D. and Kenneth N. Waltz. *The Spread of Nuclear Weapons – A Debate*. New York: W. W. Norton & Company, 1995.
- Setter, Robert G. "Taiwan: Recent Developments and US Policy Choices." Foreign Affairs and National Defense Division, Congressional Research Service: Issue Brief, IB94006, 8 November 1995.
- Shlapak, David. "China Defense Modernization and the USAF." Briefing notes, RAND, Project Air Force, December 1997.
- Sun, Maoqing. "Fly Toward the 21st Century—An On-the-Spot Report on the Modernization Drive of the People's Air Force." Xinhua, November 10, 1994, in FBIS-CHI-94-228, November 28, 1994.
- Swaine, Michael D. *The Role of the Chinese Military in National Security Policymaking*. Santa Monica, CA: Rand, 1996.
- Swaine, Michael D. "The Modernization of the Chinese People's Liberation Army: Prospects and Implications for Northeast Asia." *Analysis*, vol. 5, no. 3, October 1994.
- Wortzel, Larry M. "China and Strategy: China Pursues Traditional Great-Power Status." *Orbis*, vol. 38, no. 2, Spring 1994, pp. 157-175.
- Young, Peter L. "Asia's Economic Crisis – The Challenge of Containing the Damage." *Armed Forces Journal International*, February 1998, pp. 26-30.